

FIG. 1

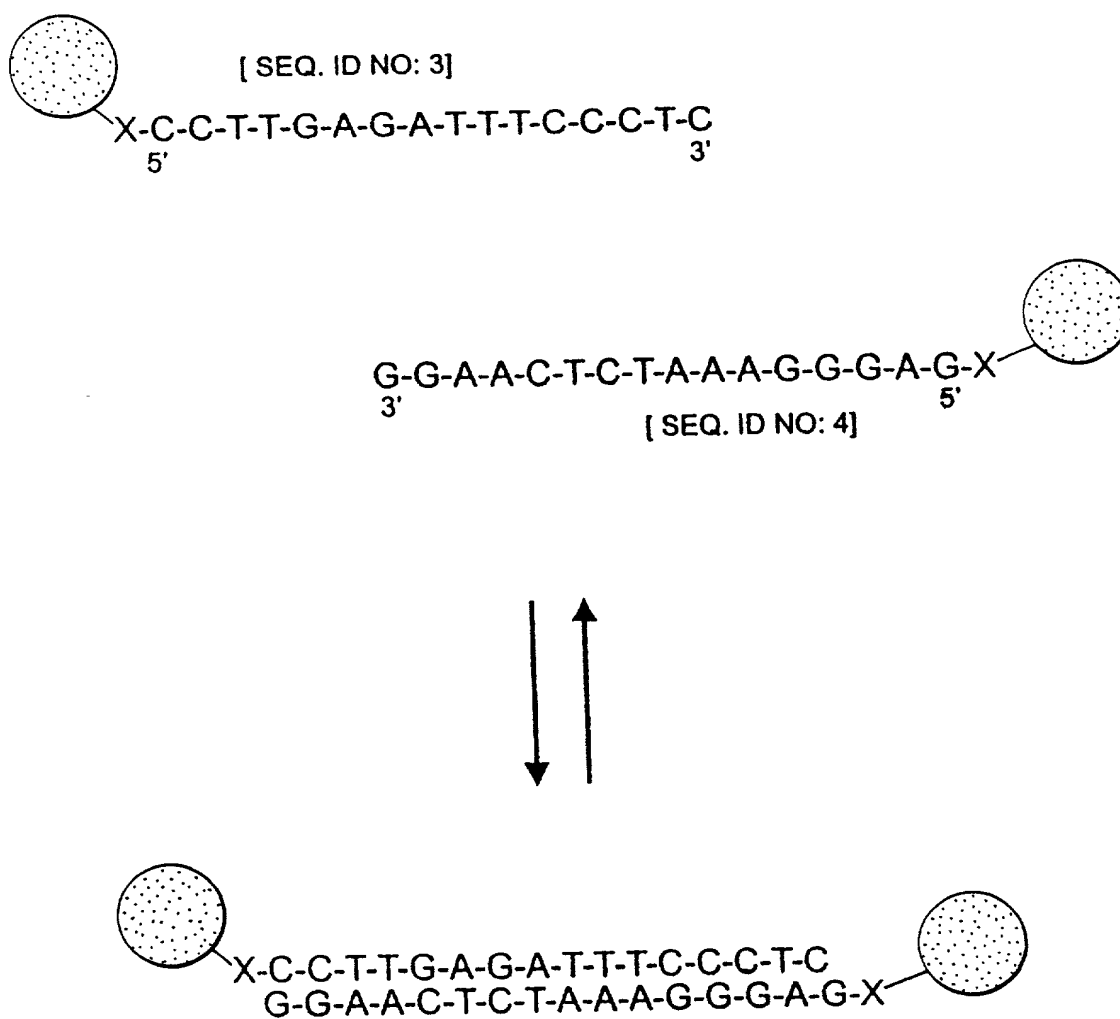


FIG. 2

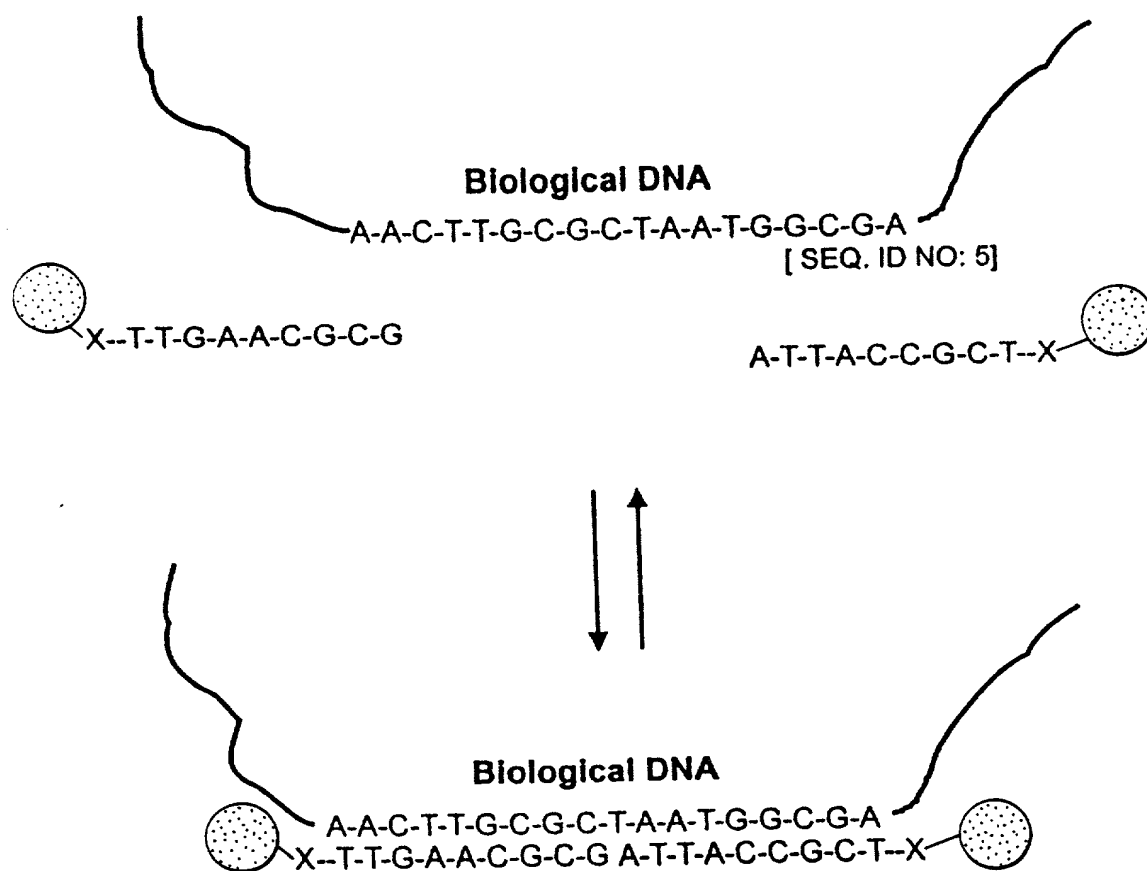


FIG. 3

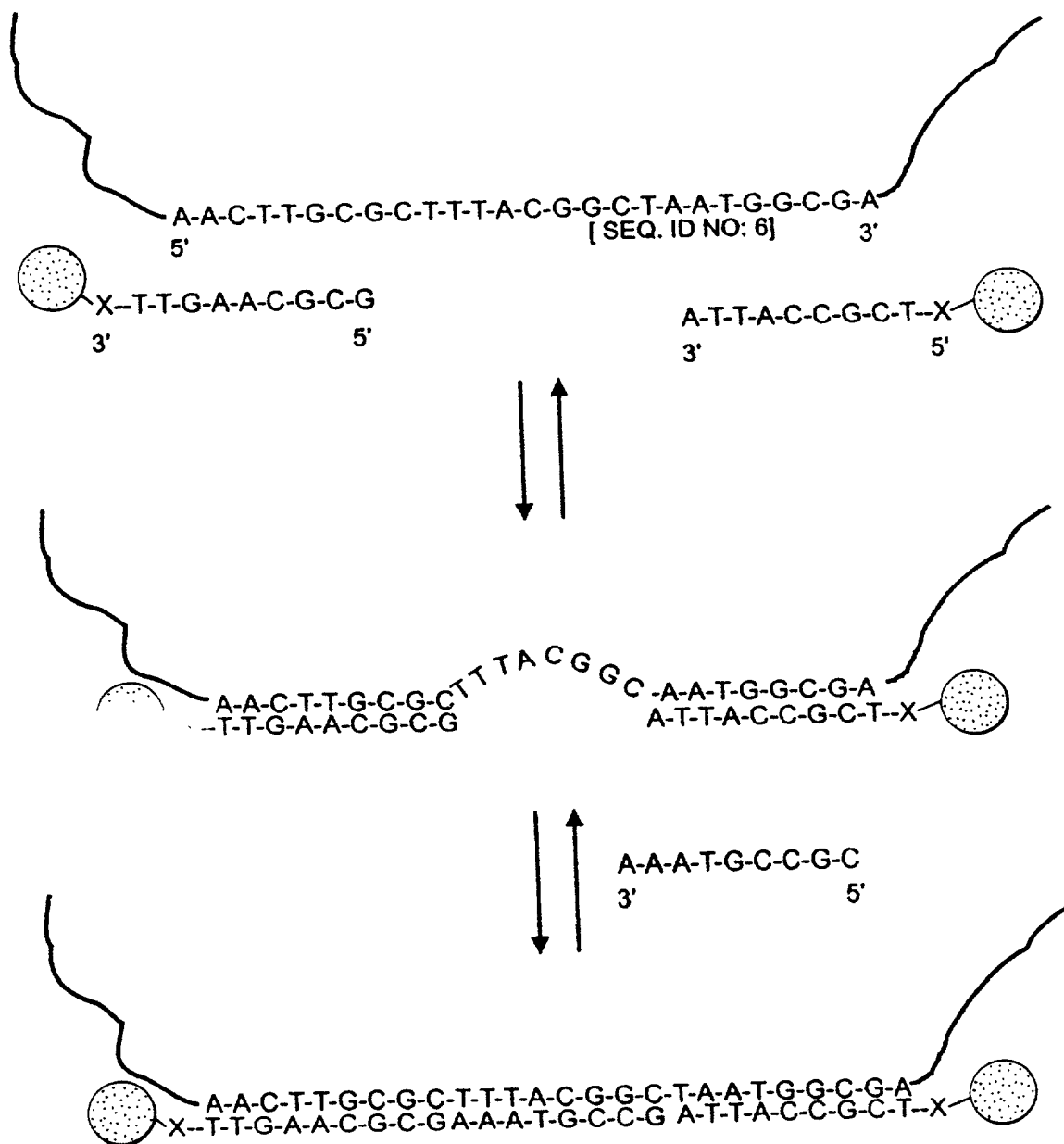


FIG. 4 5' A-T-G-G-C-A-A-C-T-A-T-A-C-G-C-G-C-T-A-G 3' Linking oligonucleotide
[SEQ. ID NO: 2] A-T-A-T-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-A 5' [SEQ. ID NO: 1]

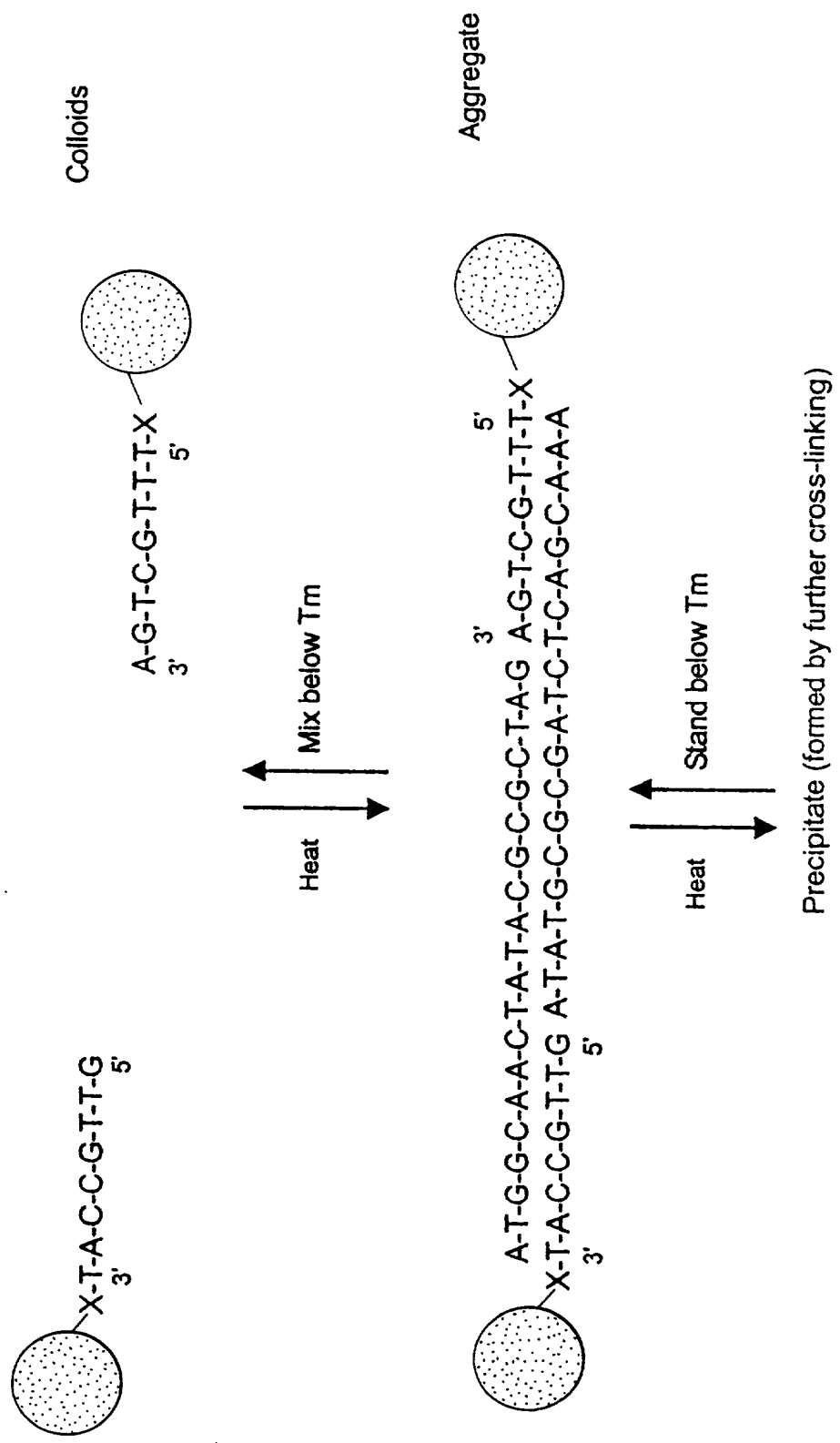


FIG. 5

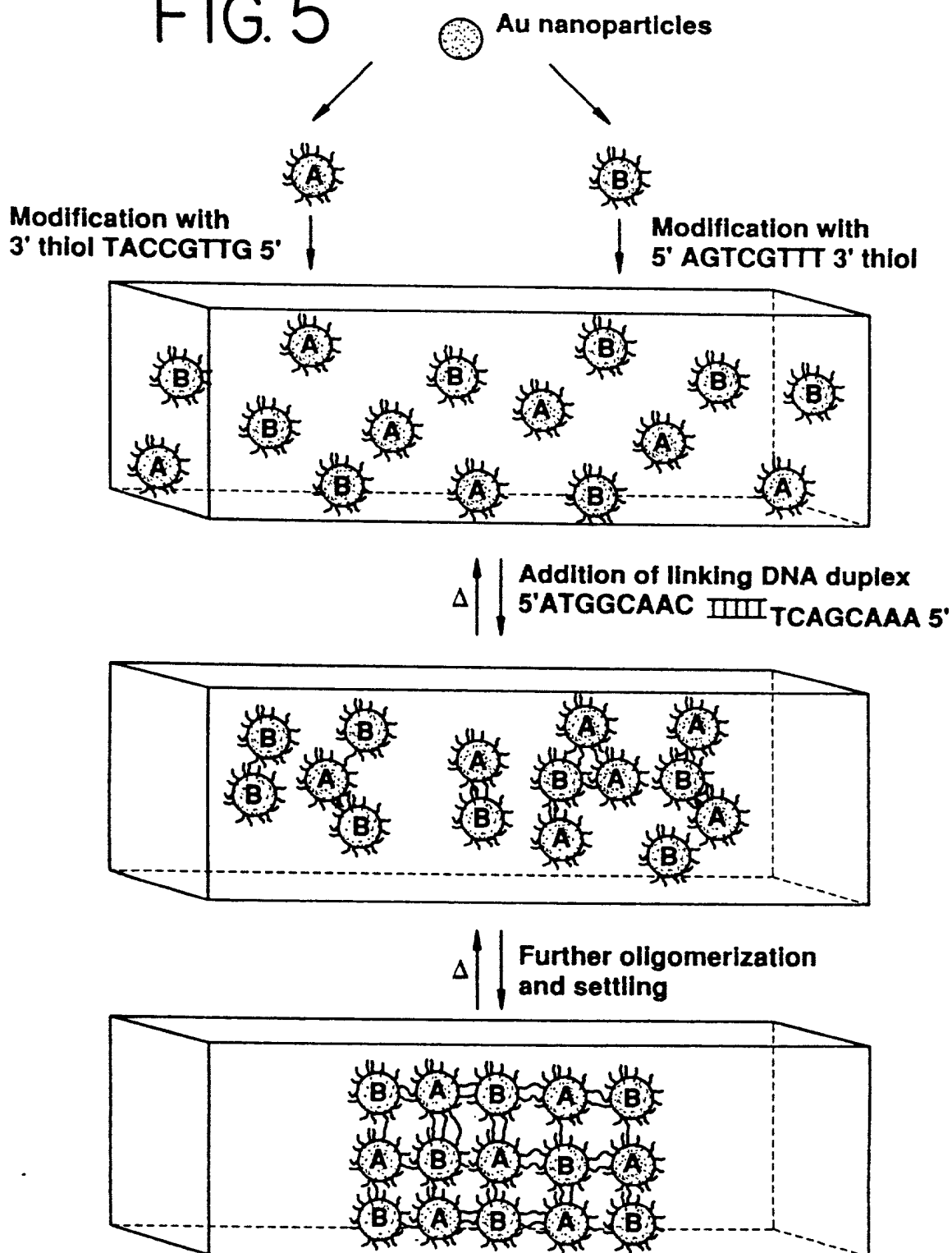


FIG. 6A FIG. 6B FIG. 6C



FIG. 7

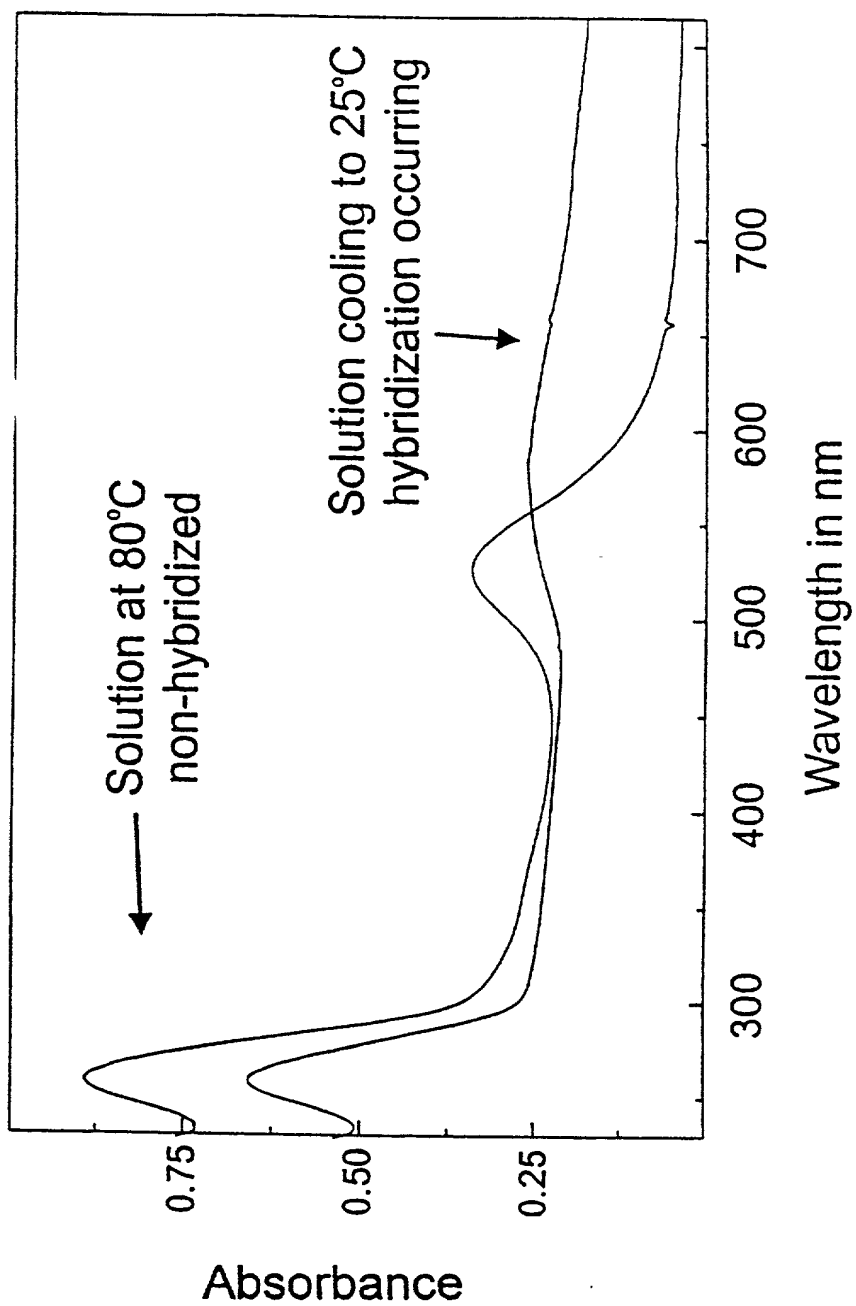


FIG. 8B

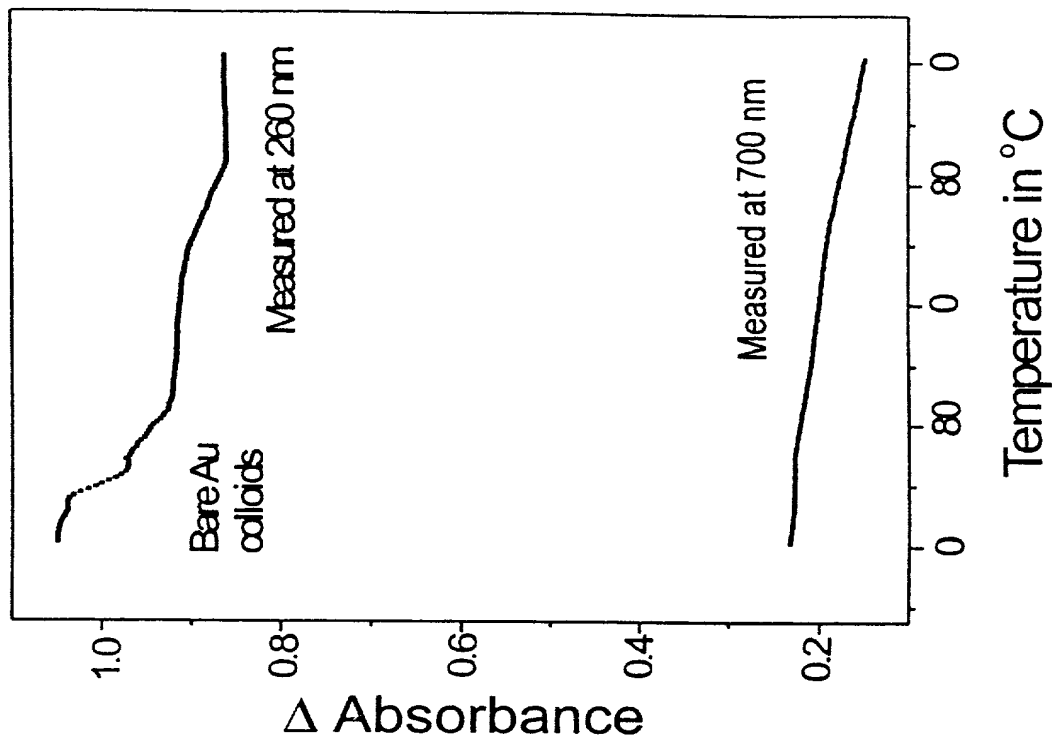
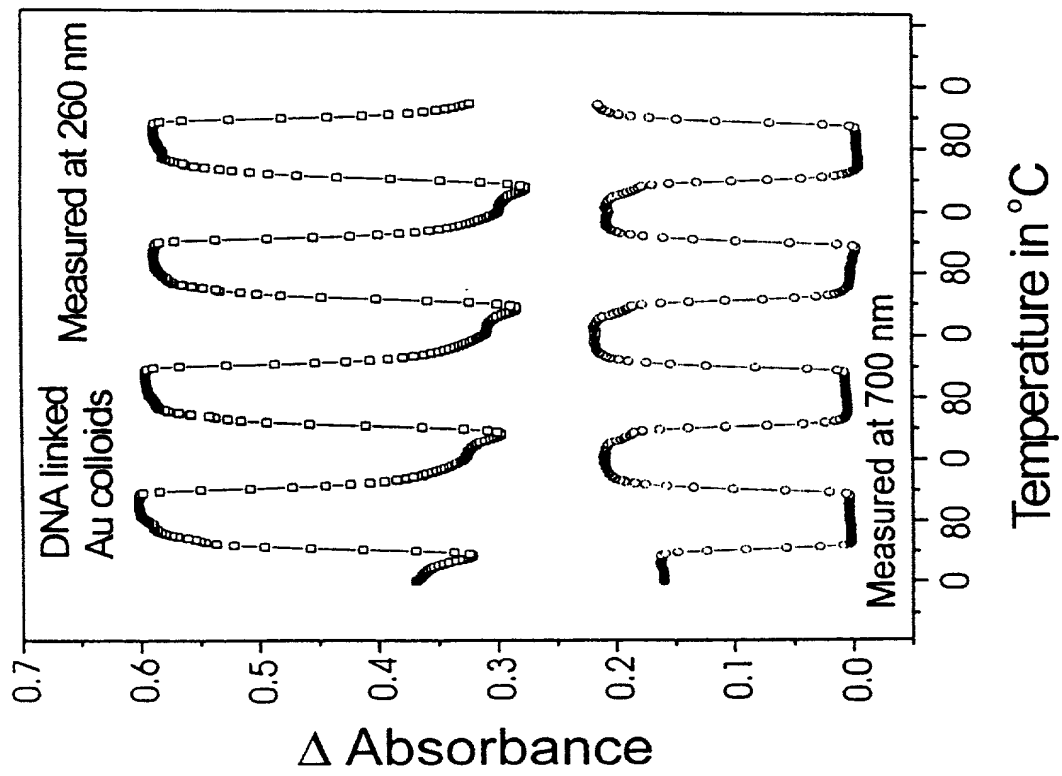


FIG. 8A



Electron micrograph showing a DNA molecule (dark, irregular shape) against a light background. A scale bar is present at the bottom right, labeled "33 nm".

FIG. 10

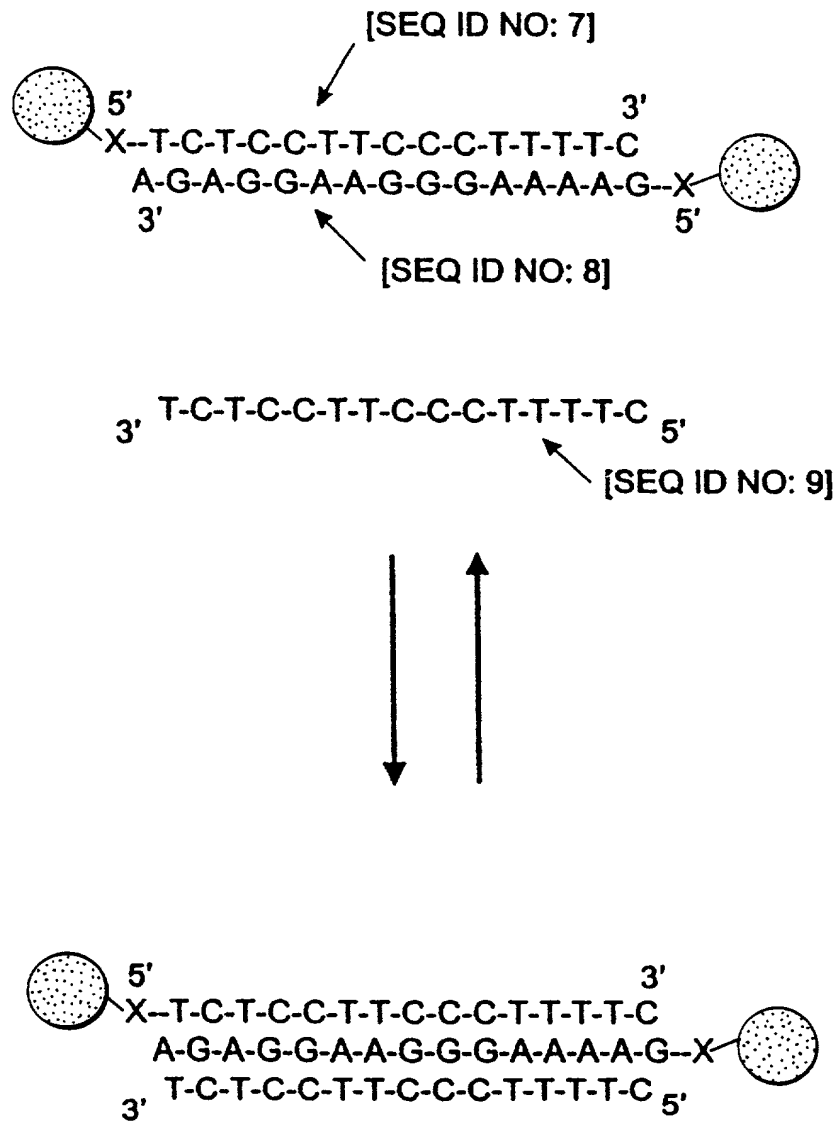


FIG. 11

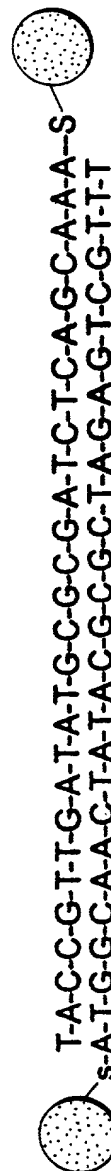
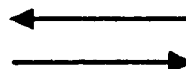
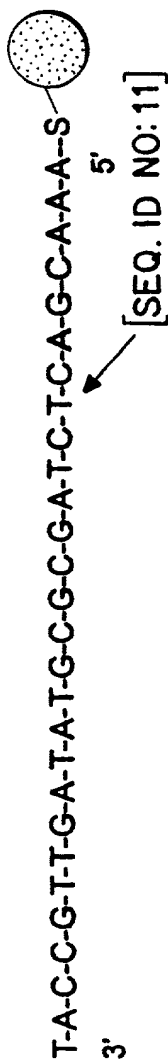
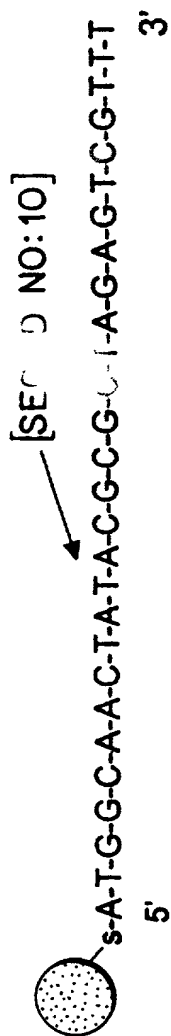


FIG. 12A

Complementary Target

[SEQ. ID NO:12]

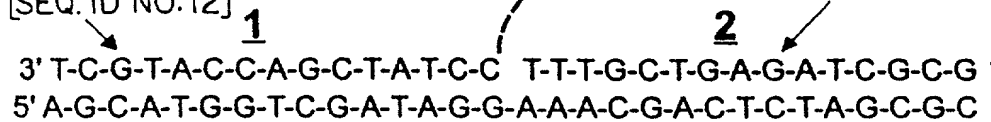


FIG. 12B

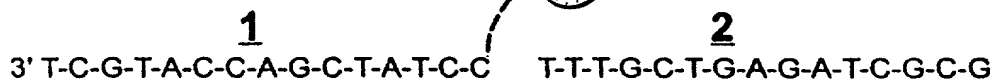
Probes without Target

FIG. 12C

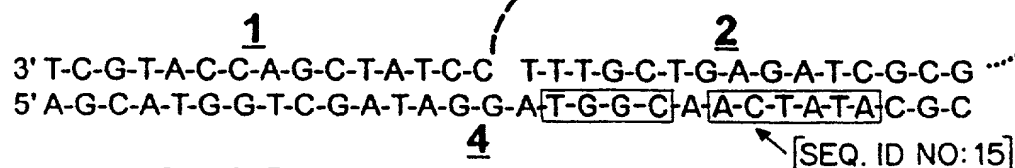
Half Complementary Target

FIG. 12D

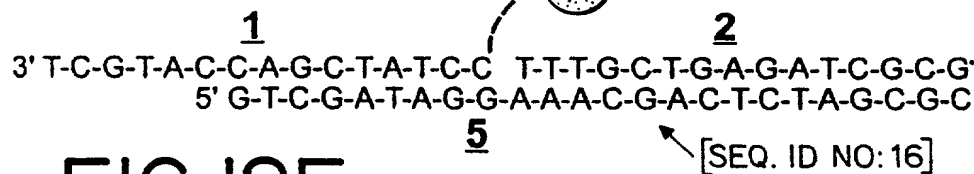
Target - 6 bp

FIG. 12E

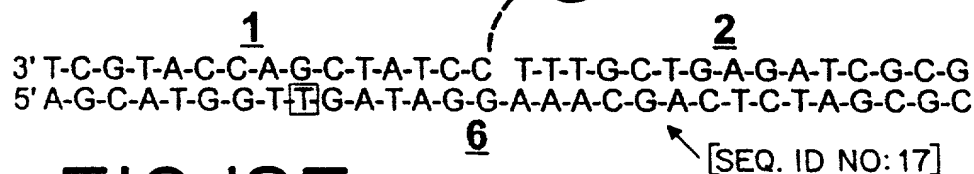
One bp Mismatch

FIG. 12F

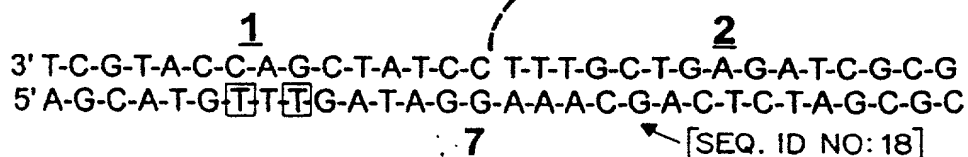
Two bp Mismatch

FIG. 13A

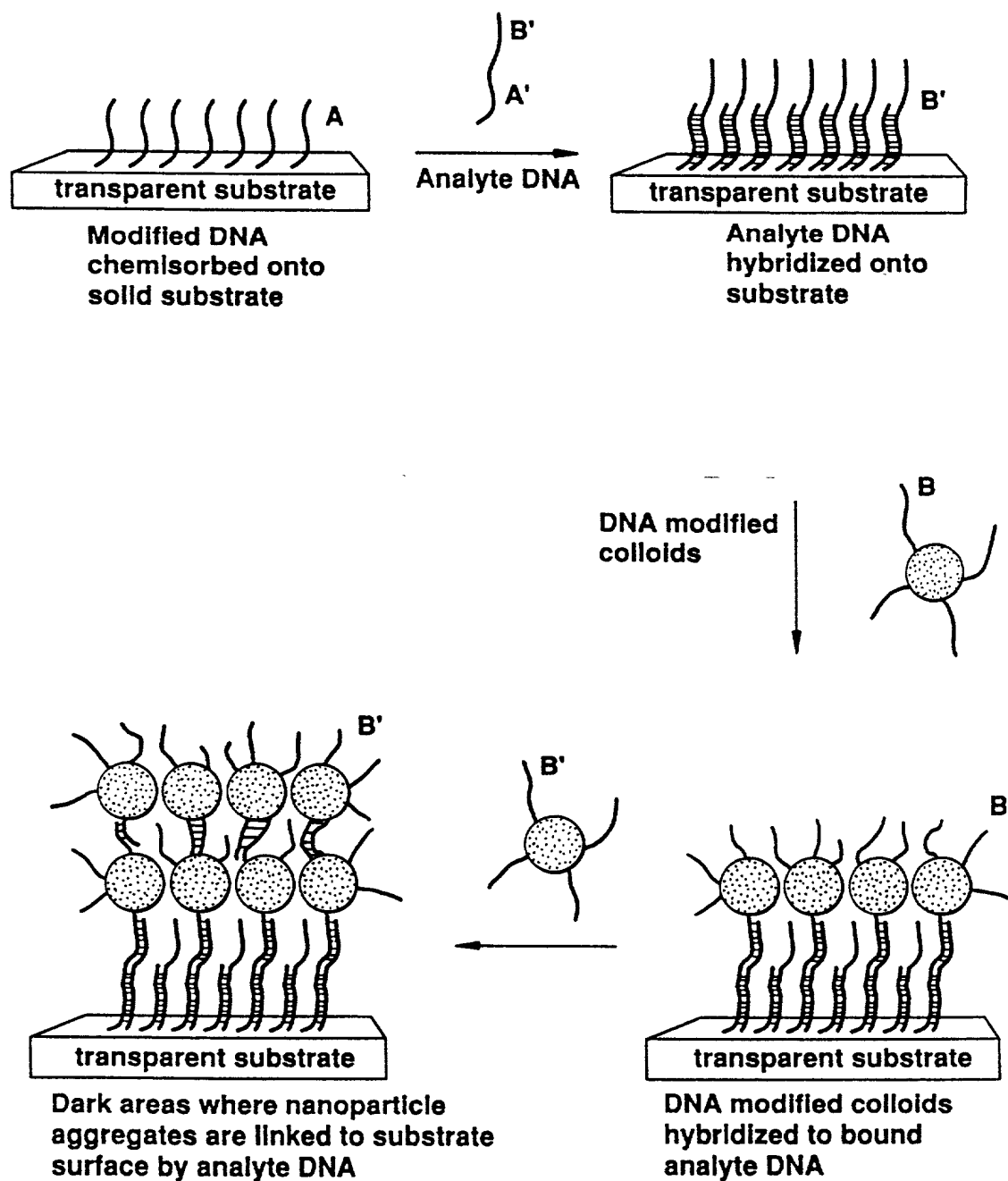


FIG. 13B

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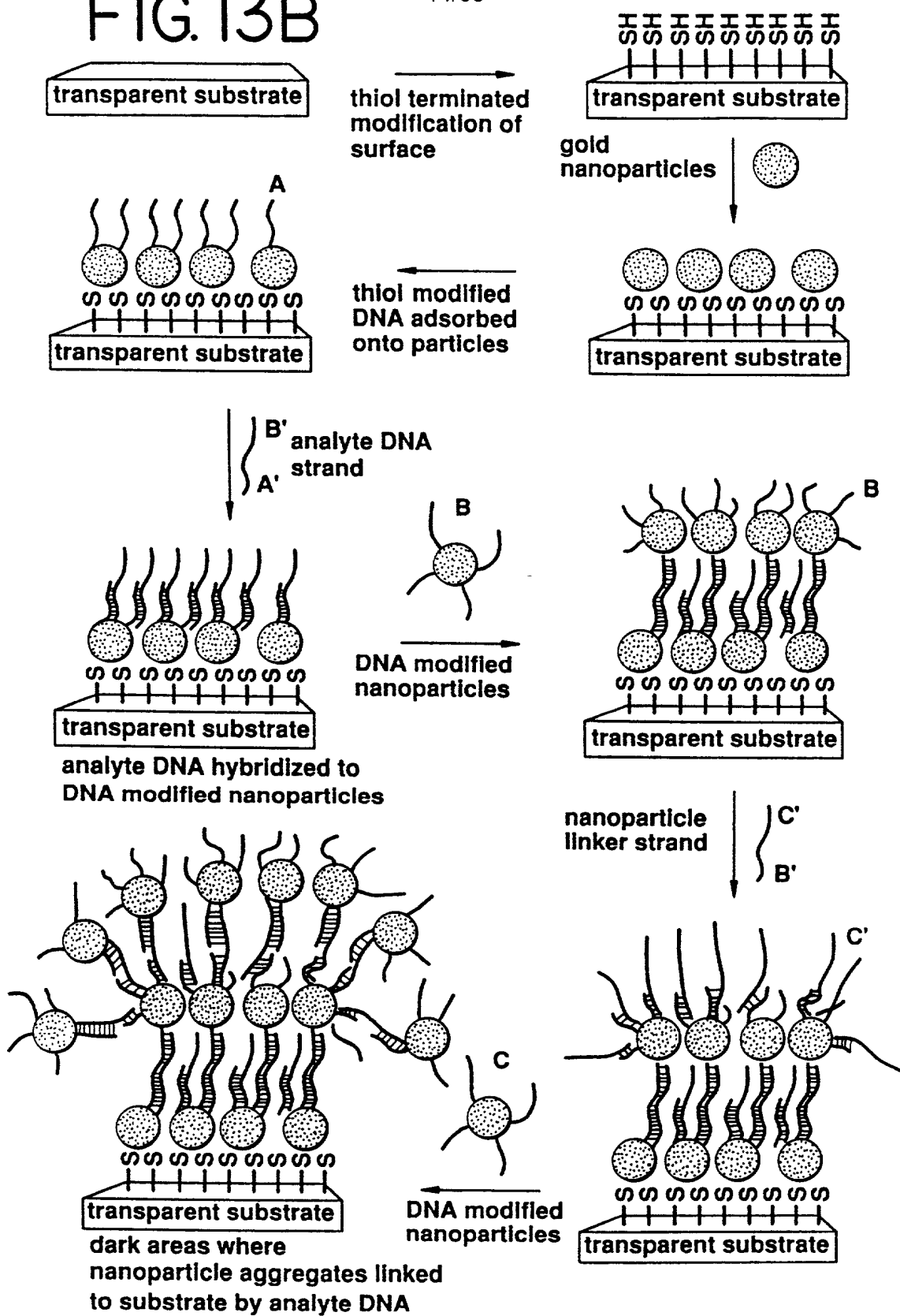


FIG. 14A

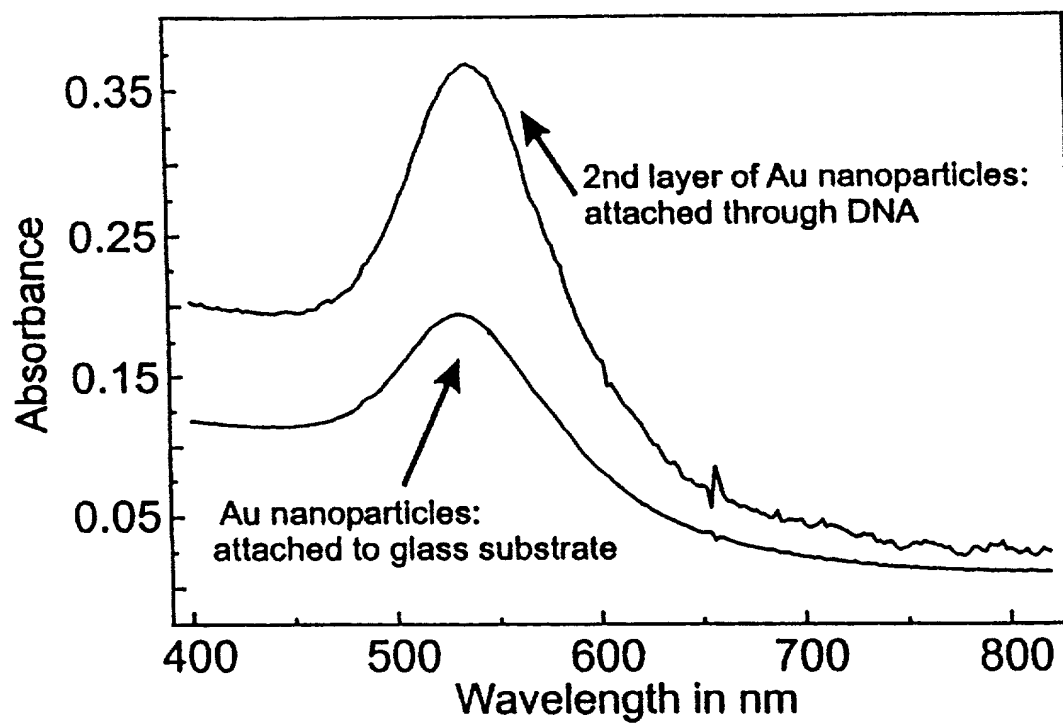


FIG. 14B

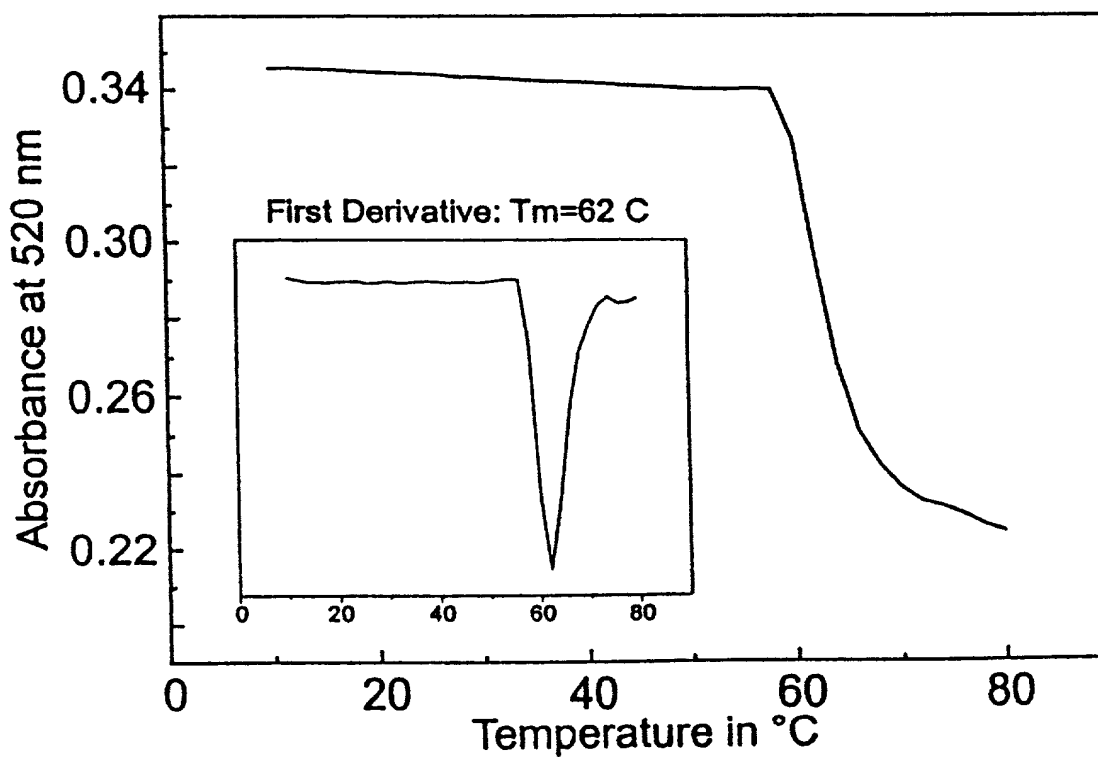


FIG. 15A

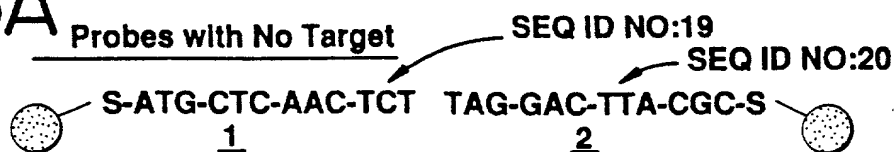


FIG. 15B

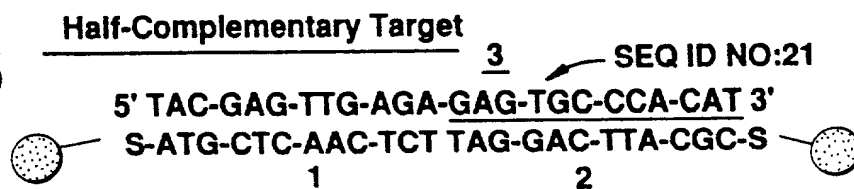


FIG. 15C

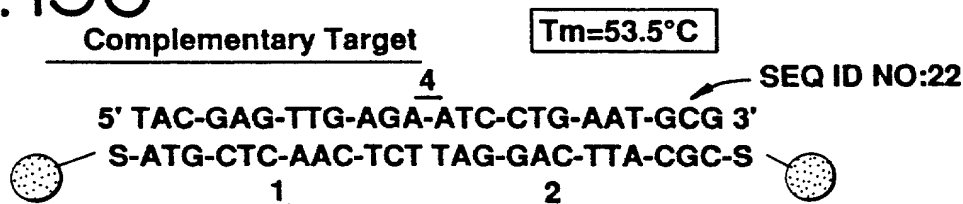


FIG. 15D

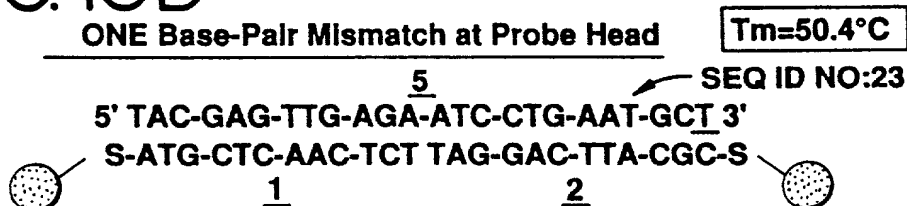


FIG. 15E

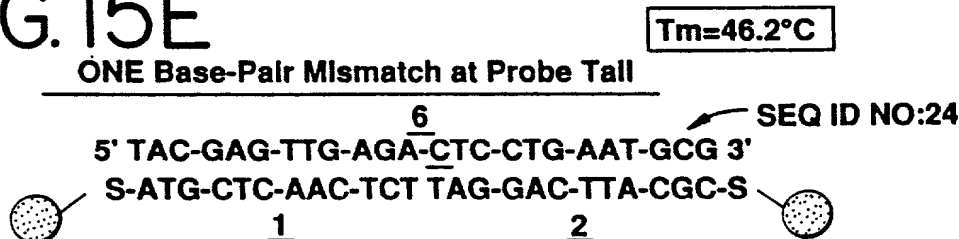


FIG. 15F

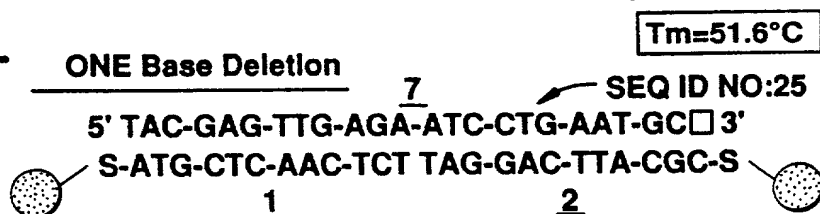
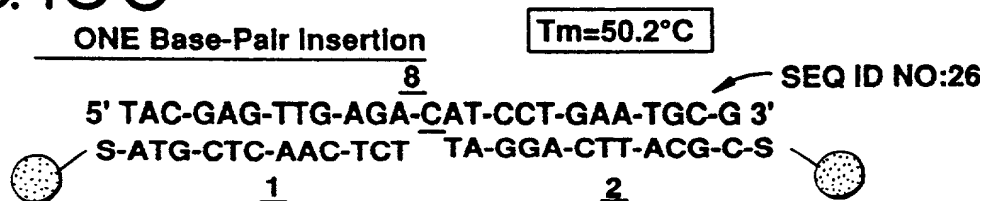


FIG. 15G



24 Base Template

5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GCG 3'
 —S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S —

1 2

FIG. 16A

FIG. 16B

48 Base Template with Complementary 24 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-ATC-CTG-AAT-GCG 3'
 —S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT TAG-GAC-TTA-CGC-S —

1 2

FIG. 16C

72 Base Template with Complementary 48 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-TAT-ATT-GGA-CGC-TTT-ACG-GAC-AAC-ATC-CTG-AAT-GCG 3'
 —S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT-ATA-TAA-CCT-GCG-AAA-TGC-CTG-TTG TAG-GAC-TTA-CGC-S —

1 2

FIG. 17A

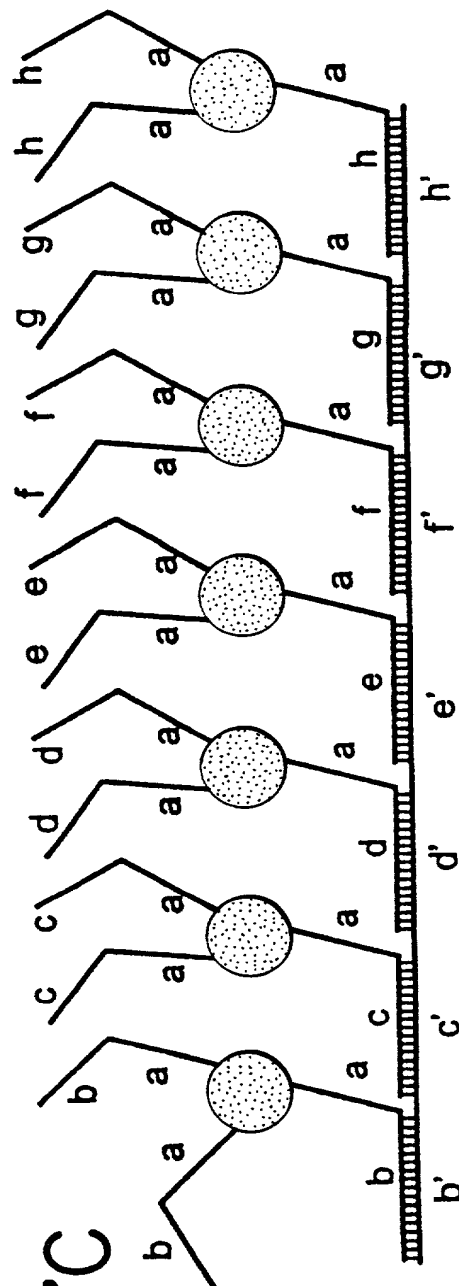
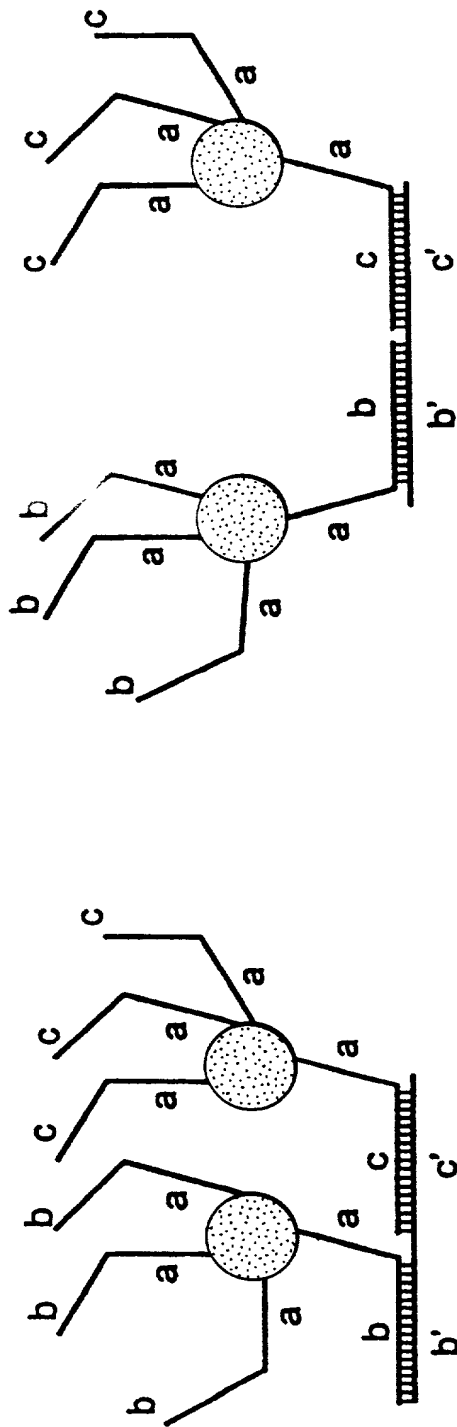


FIG. 17C

FIG. 17D

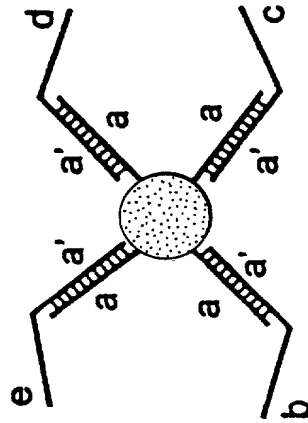
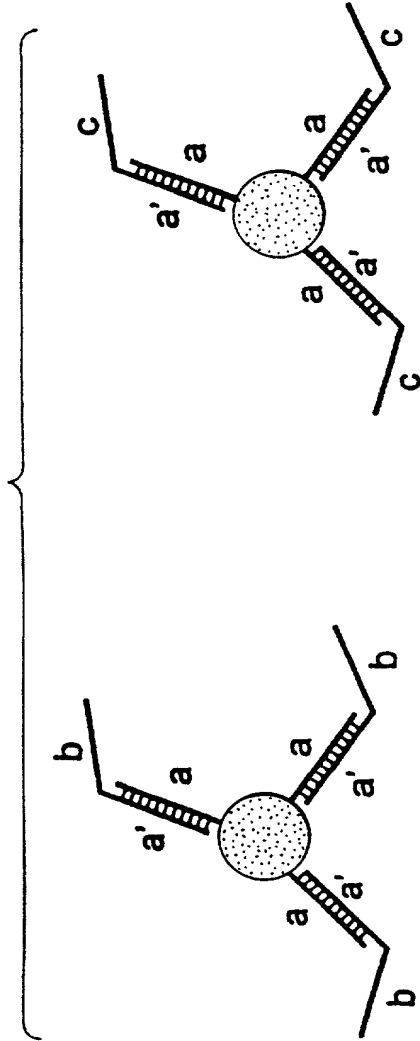


FIG. 17E

FIG. 18

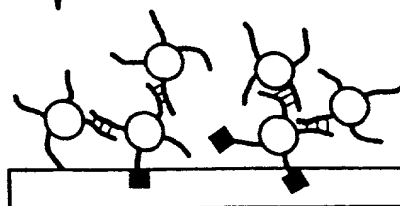
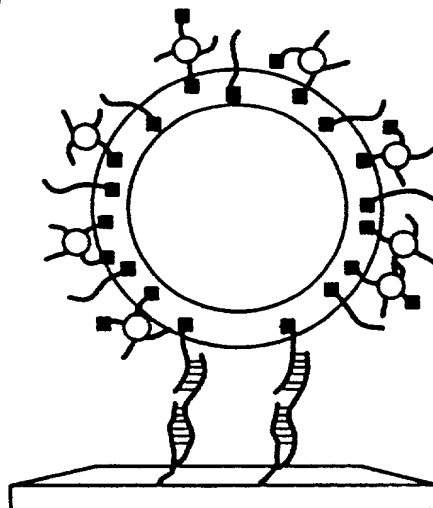
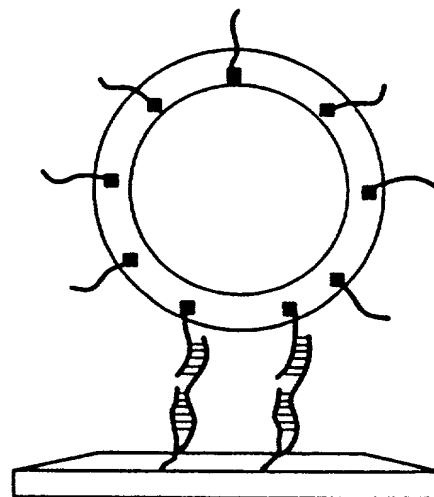


FIG. 19A

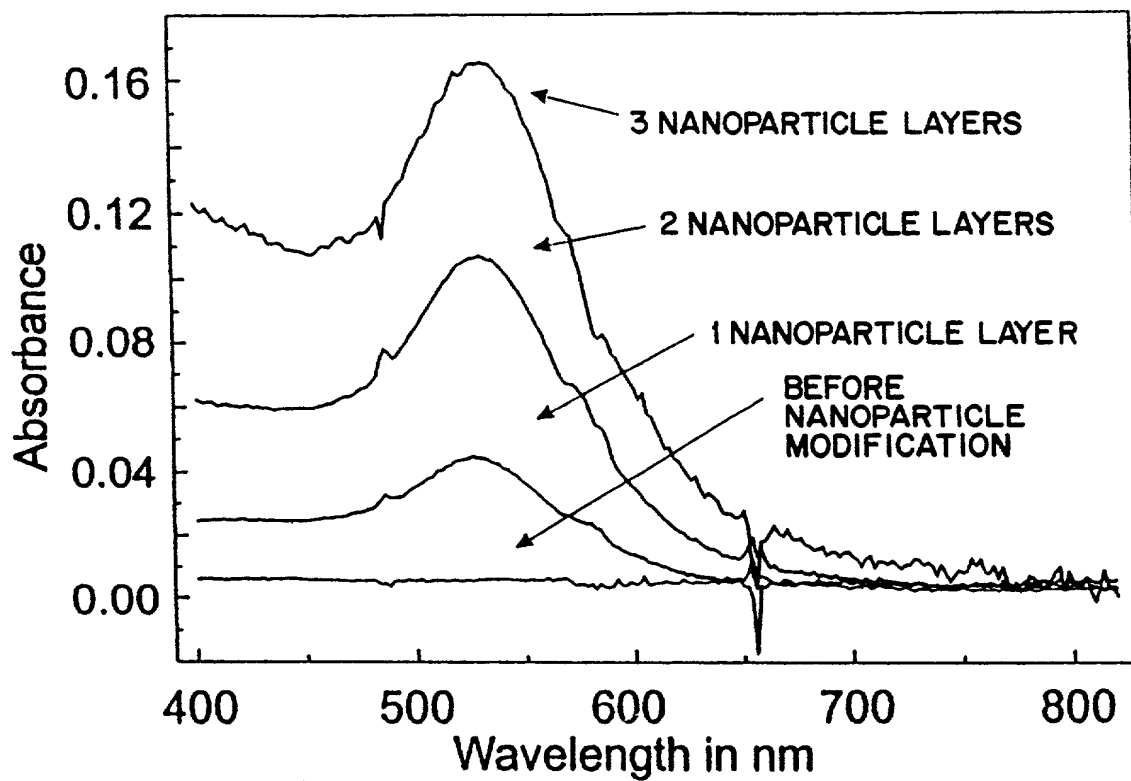


FIG. 19B

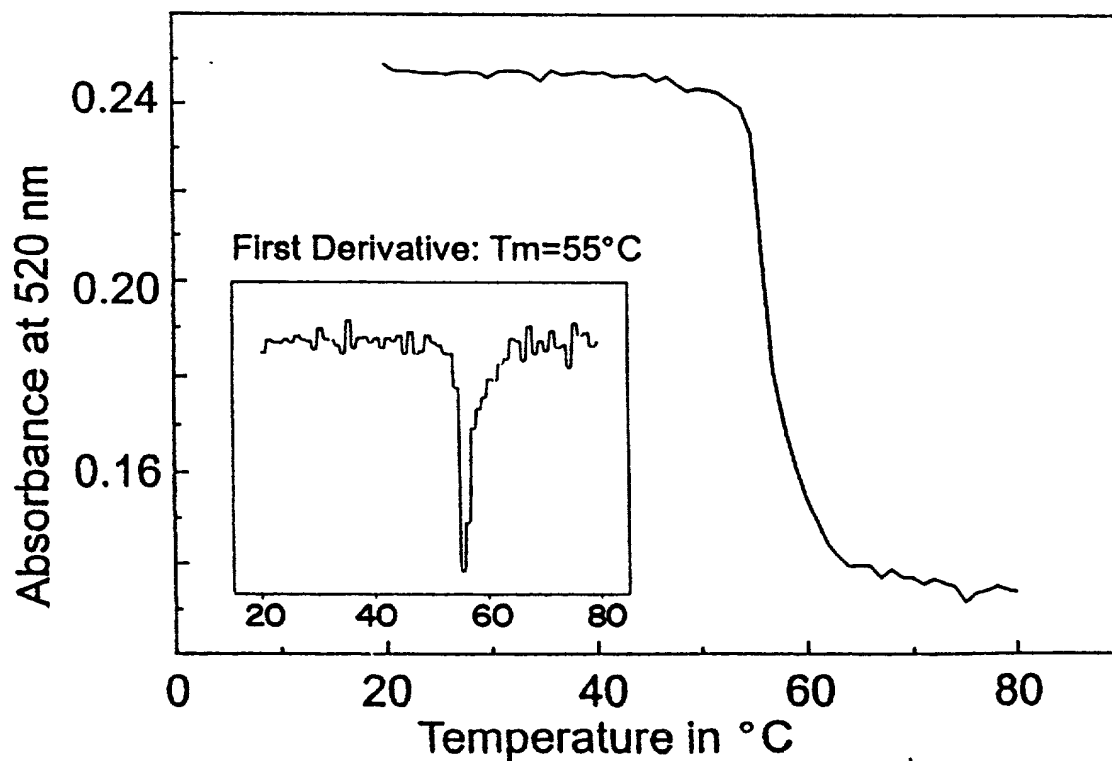


FIG. 20A

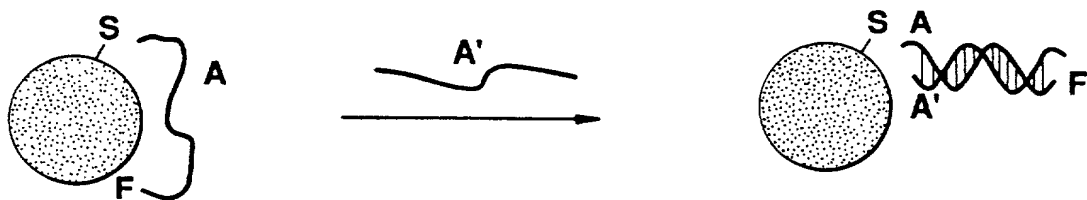
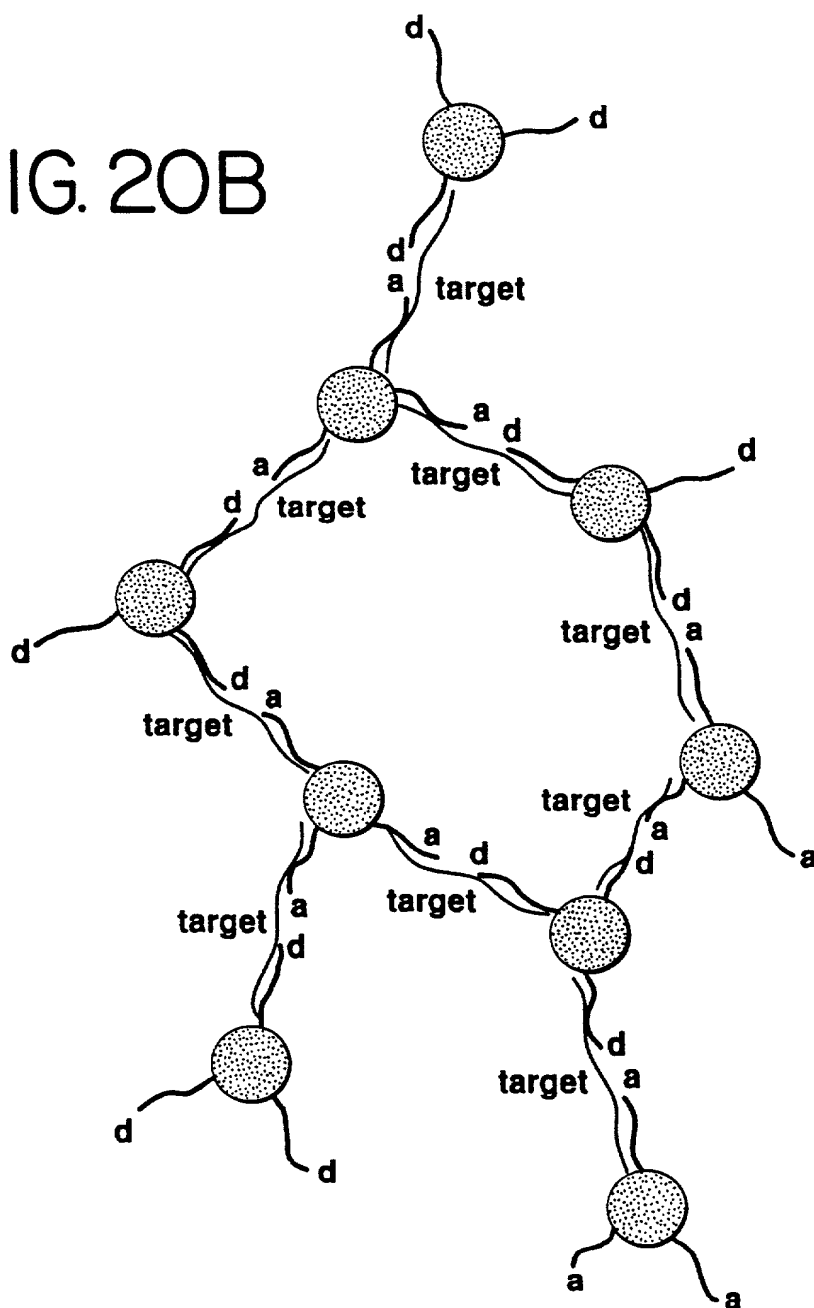


FIG. 20B



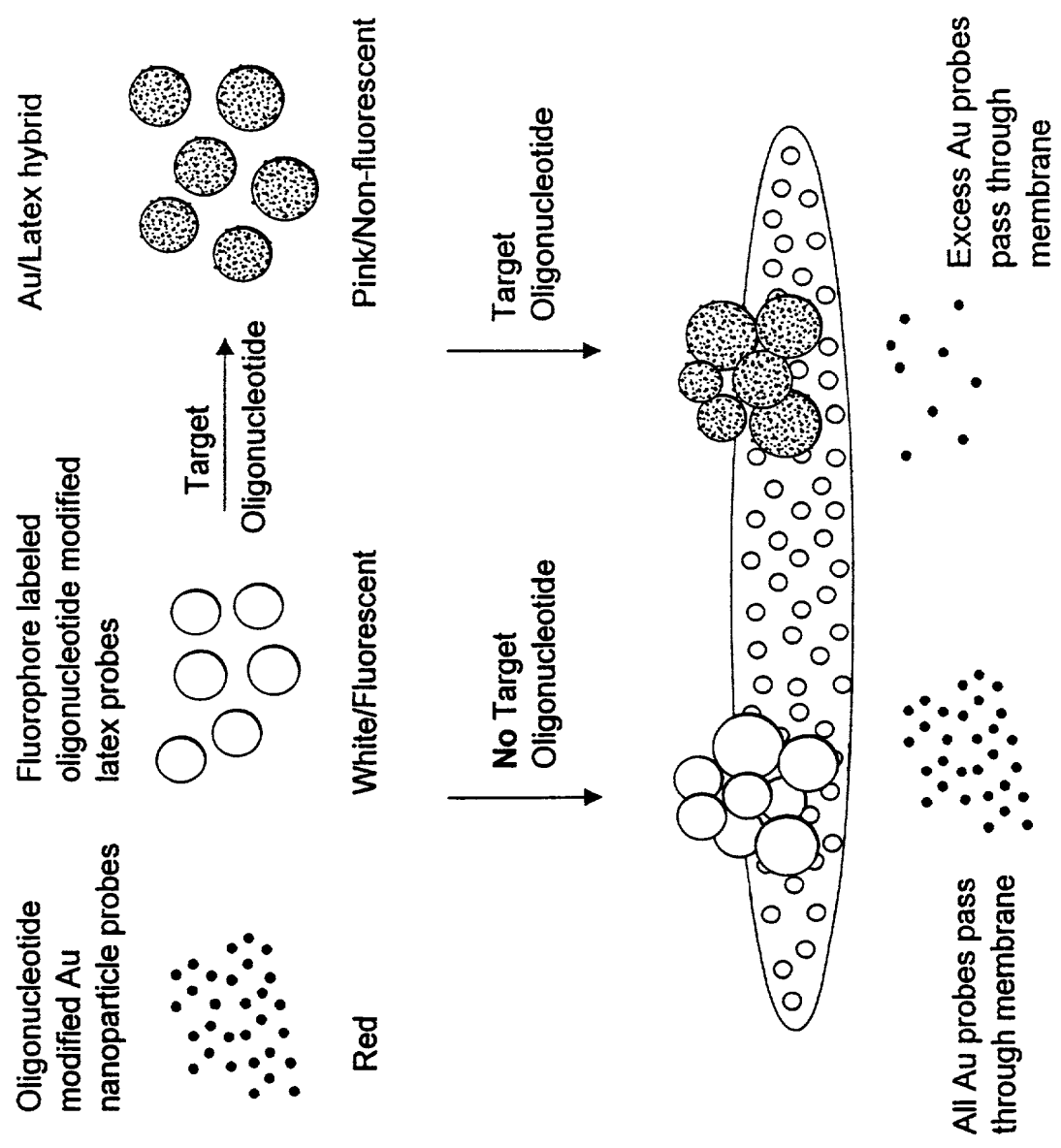


FIG. 21

FIG. 22

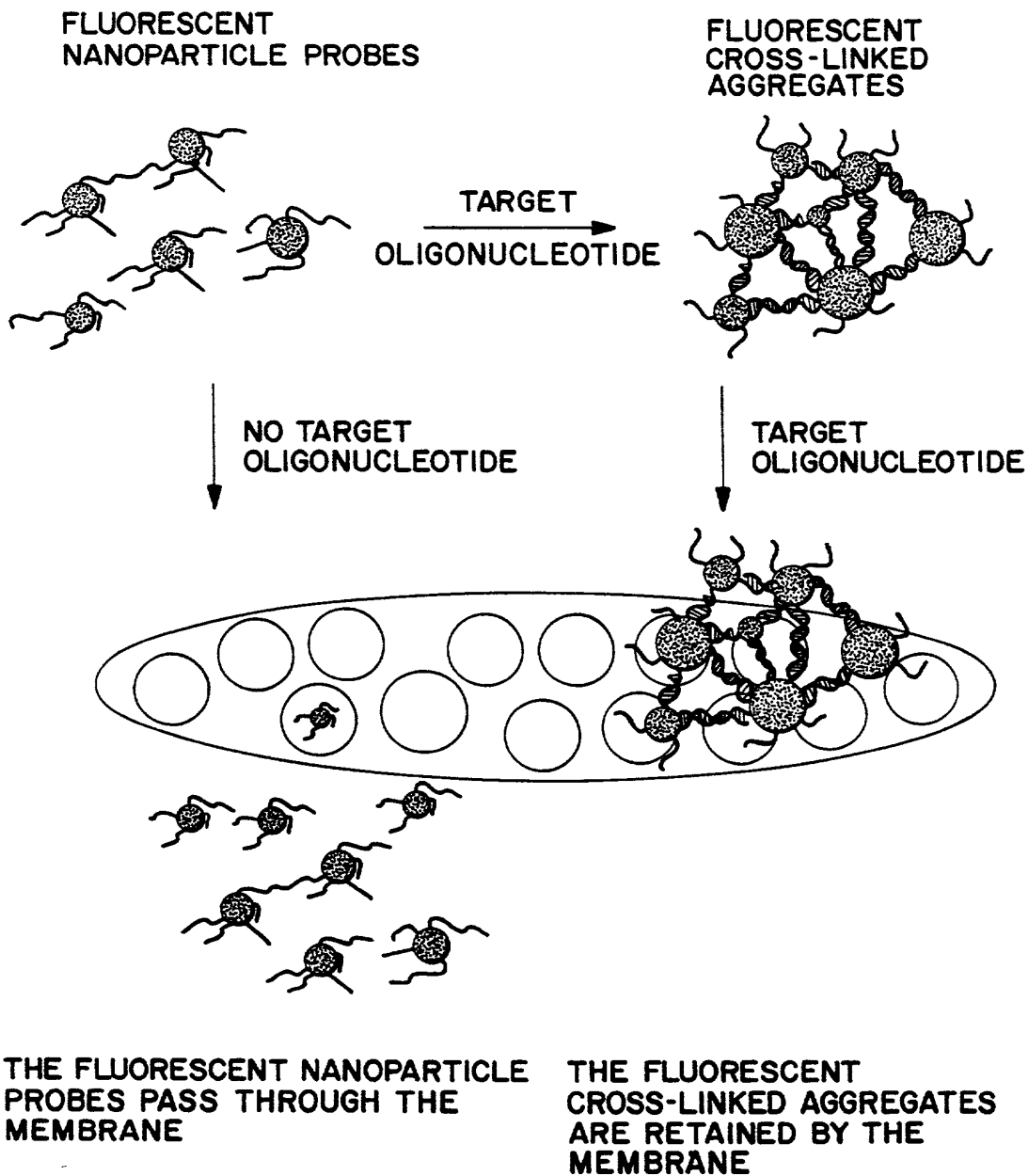


FIG. 23

Anthrax PCR Product

5'G GCG GAT GAG TCA GTA GTT AAG GAG GCT CAT AGA GAA GTA ATT AAT
3'C CGC CTA CTC AGT CAT CAA TTC CTC CGA GTA TCT CTT CAT TAA TTA

TCG TCA ACA GAG GGA TTA TTG TTA AAT ATT GAT AAG GAT ATA AGA AAA
AGC AGT TGT CTC CCT AAT AAC AAT TTA TAA CTA TTC CTA TAT TCT TTT

ATA TTA TCC AGG GTT ATA TTG TAG AAA TTG AAG ATA CTG AAG GGC TT 3'
TAT AAT AGG TCC CAA TAT AAC ATC TTT AAC TTC TAT GAC TTC CCG AA 5'

141 mer Anthrax PCR product [SEQ ID NO:36]

3' CTC CCT AAT AAC AAT

[SEQ ID NO:37]

3' TTA TAA CTA TTC CTA

[SEQ ID NO:38]

Oligonucleotide-Nanoparticle Probes

Blocker Oligonucleotides

3' C CGC CTA CTC AGT CAT CAA TTC CTC CGA GT

[SEQ ID NO:39]

3' A TCT CTT CAT TAA TTA AGC AGT TGT

[SEQ ID NO:40]

3' TAT TCT TTT TAT AAT AGG TCC CAA TAT

[SEQ ID NO:41]

3' AAC ATC TTT AAC TTC TAT GAC TTC CCG AA

[SEQ ID NO:42]

FIG. 24

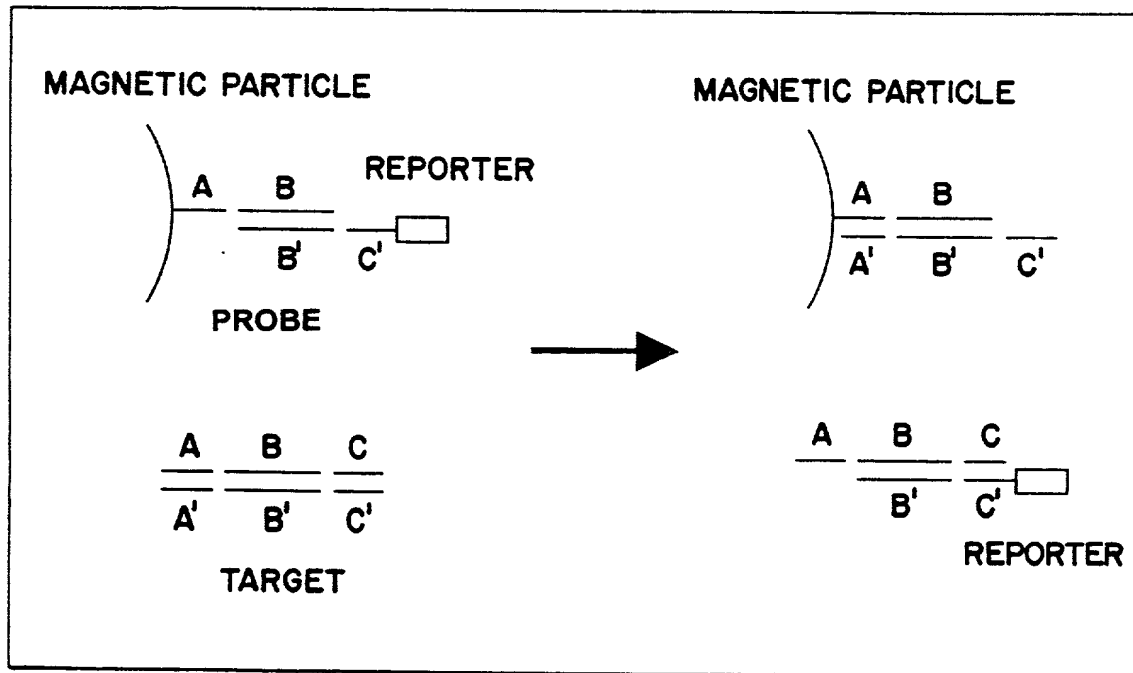
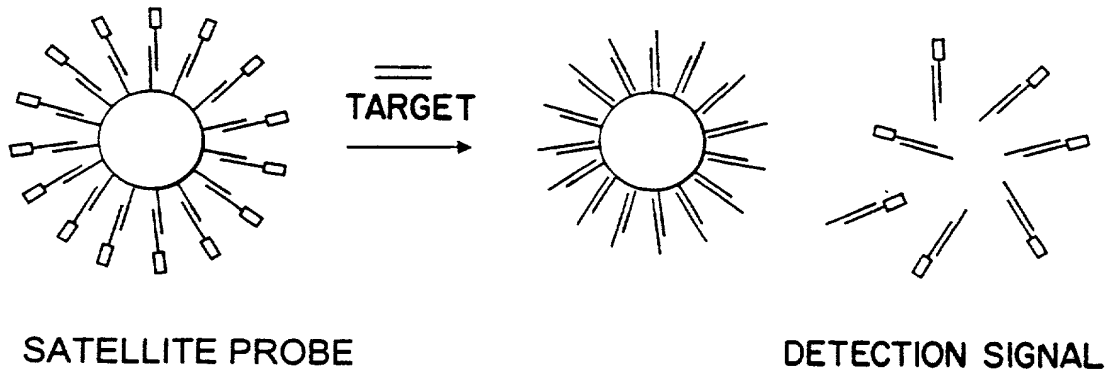


FIG. 25A

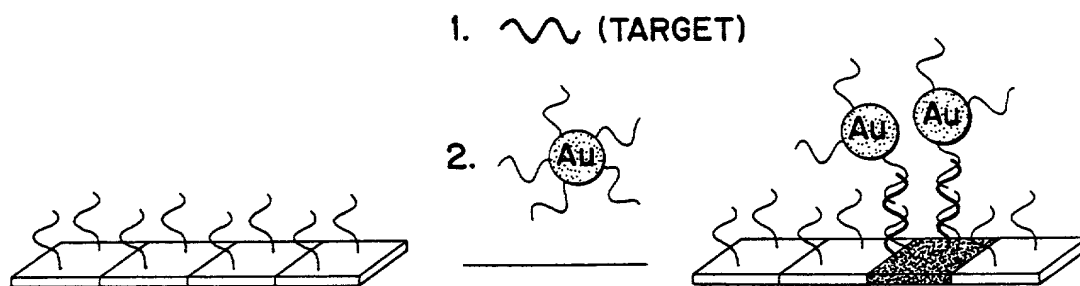


FIG. 25B

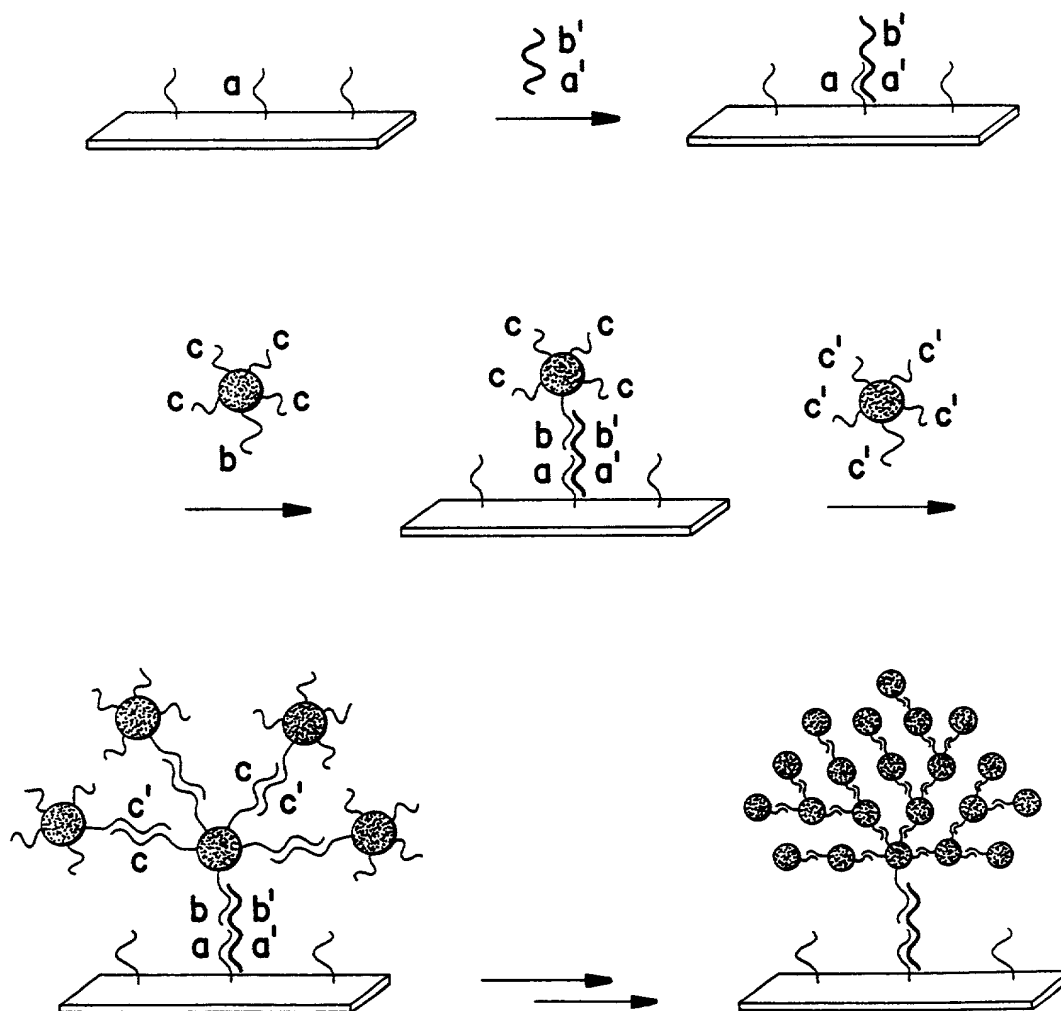


FIG. 26A

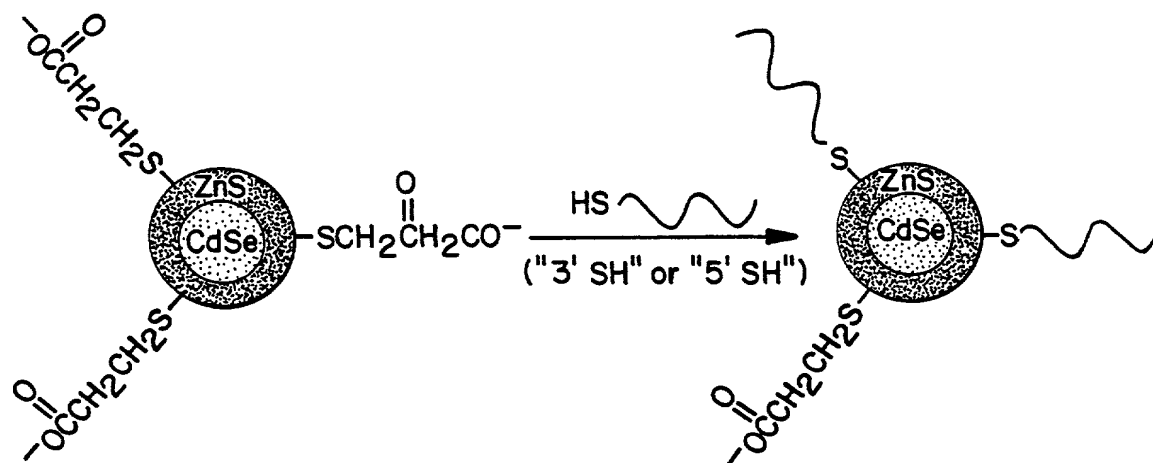


FIG. 26B

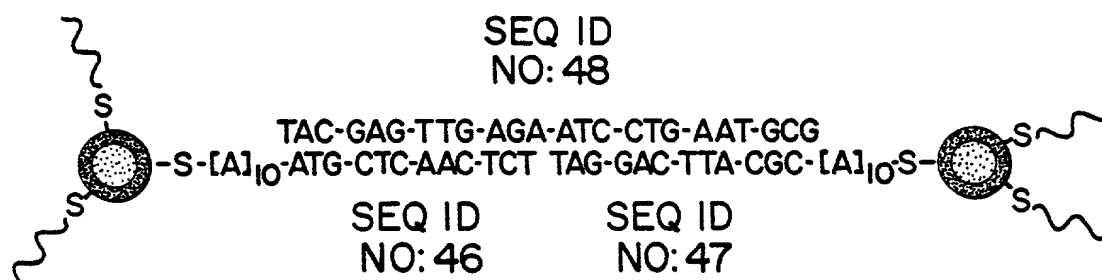


FIG. 27A

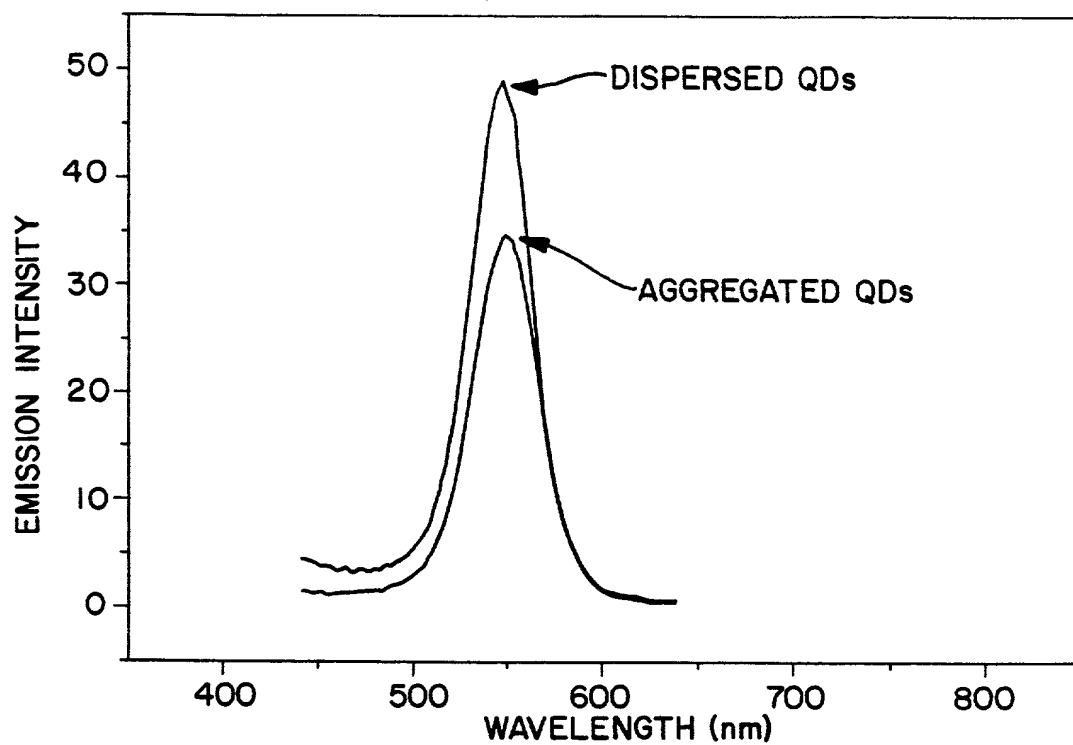


FIG. 27B

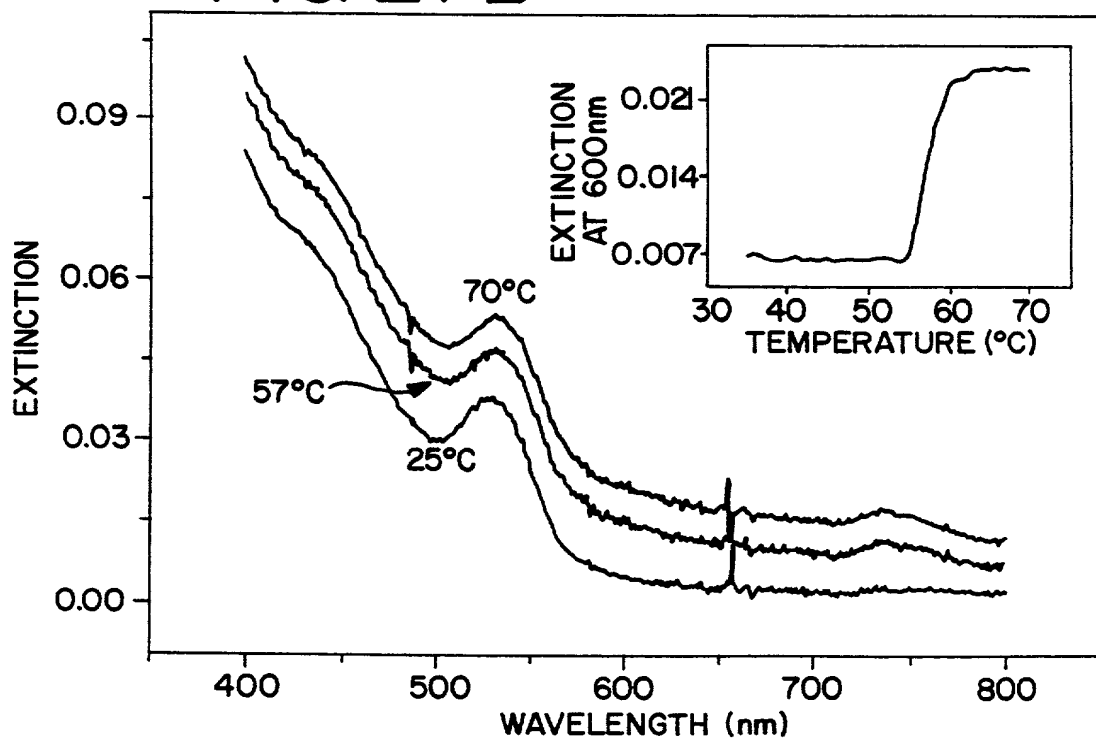


FIG. 27C

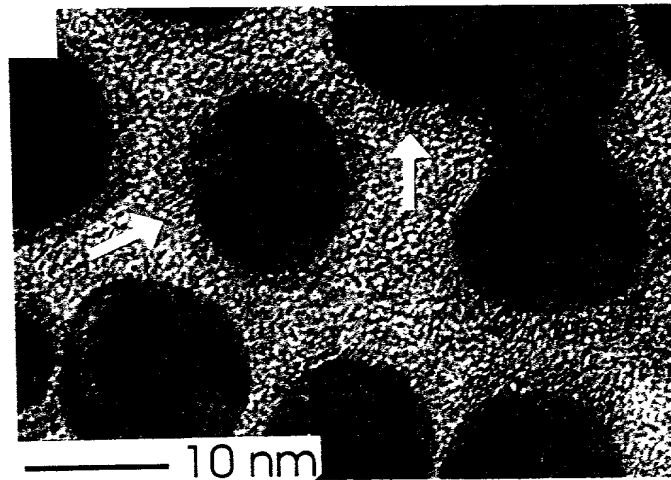


FIG. 27D

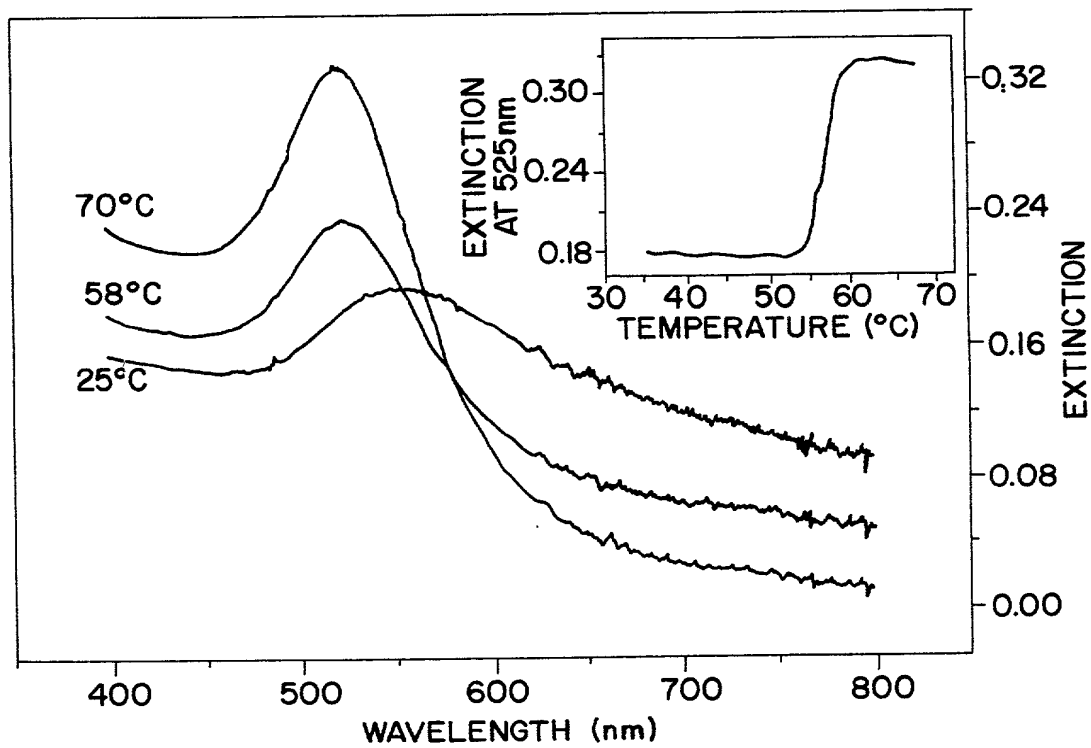


FIG. 28A

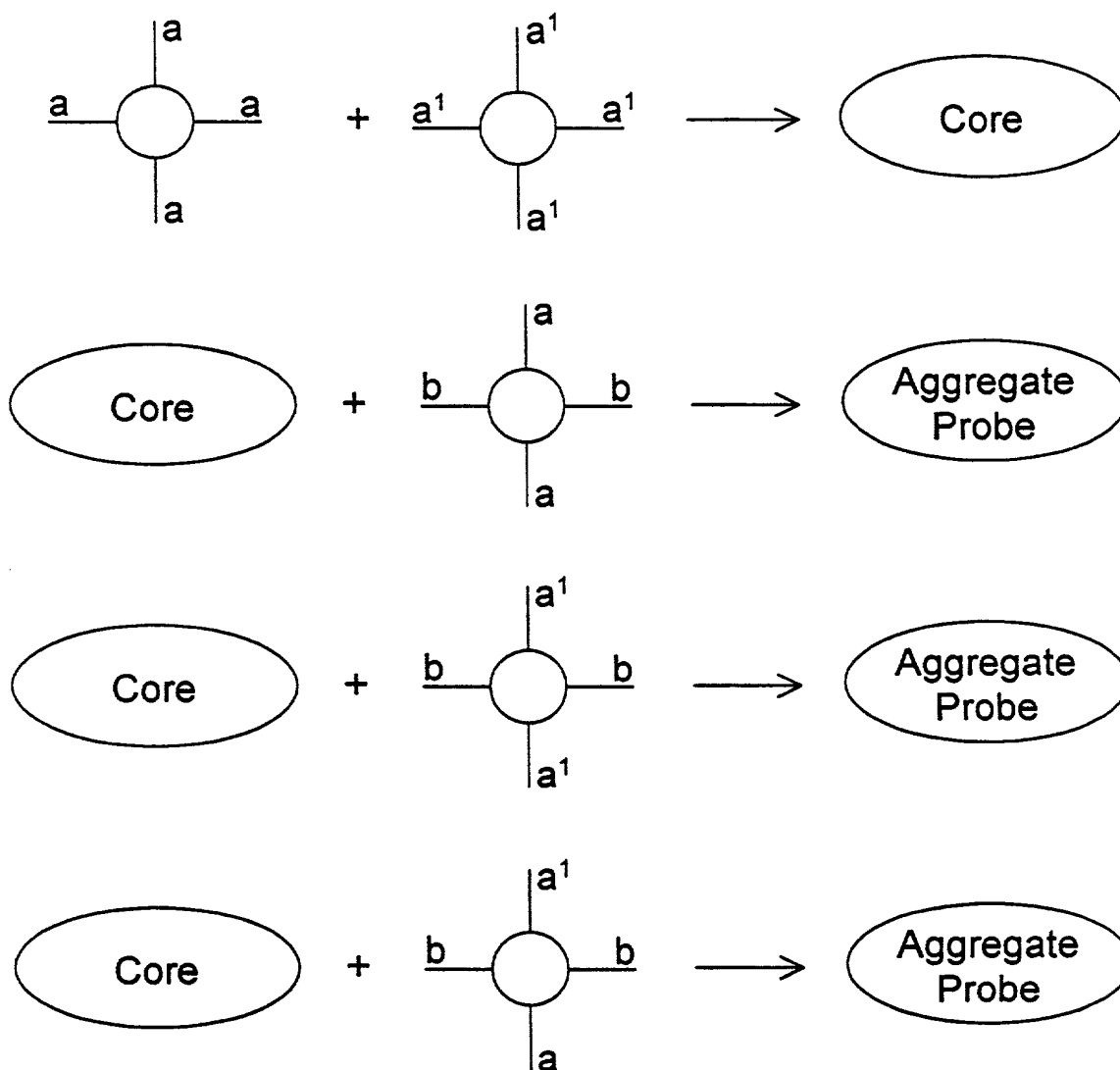


FIG. 28B

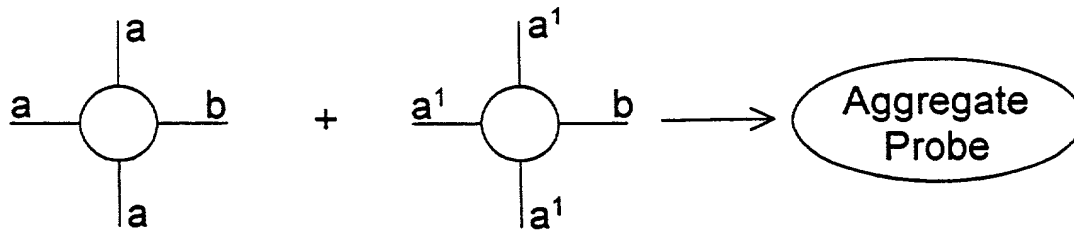


FIG. 28C

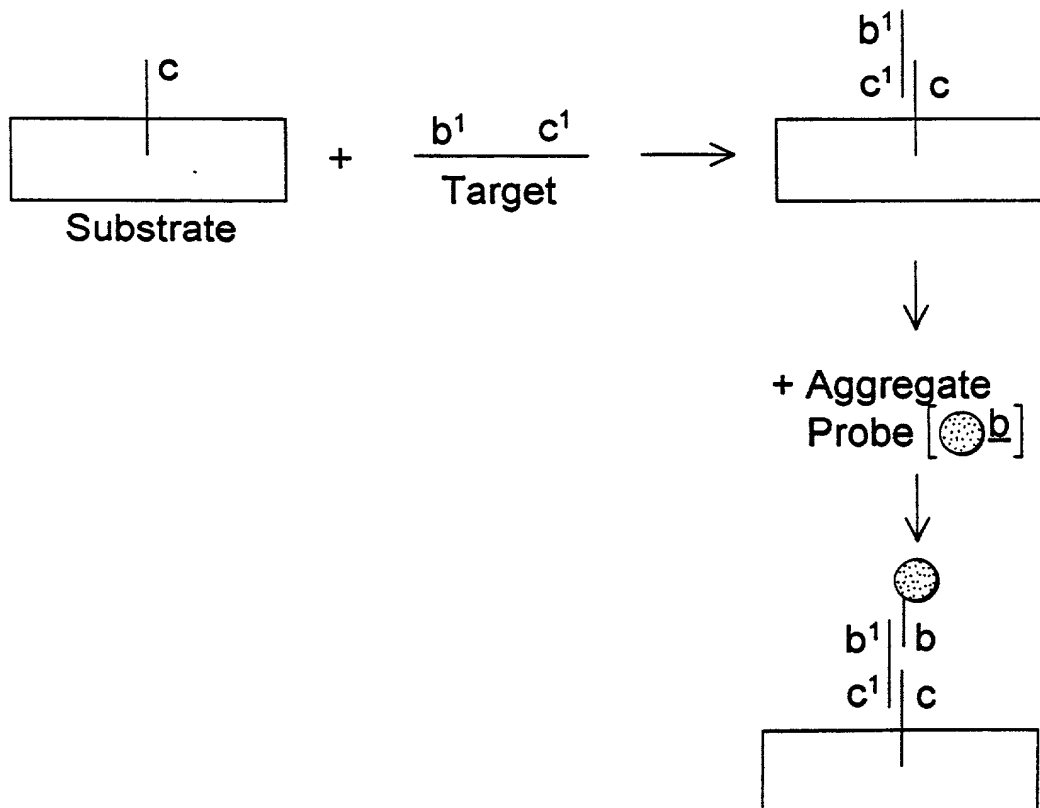


FIG. 28D

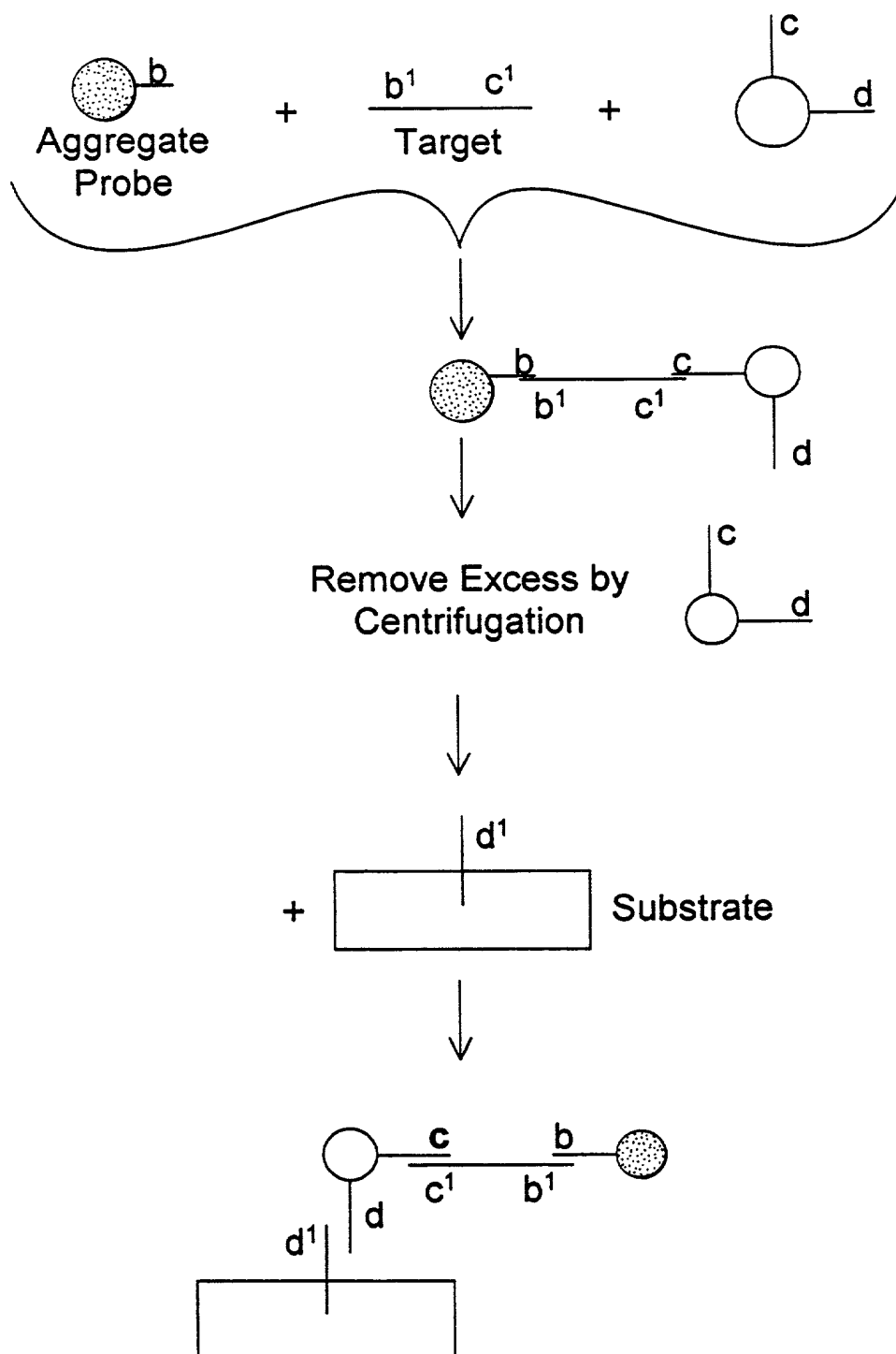
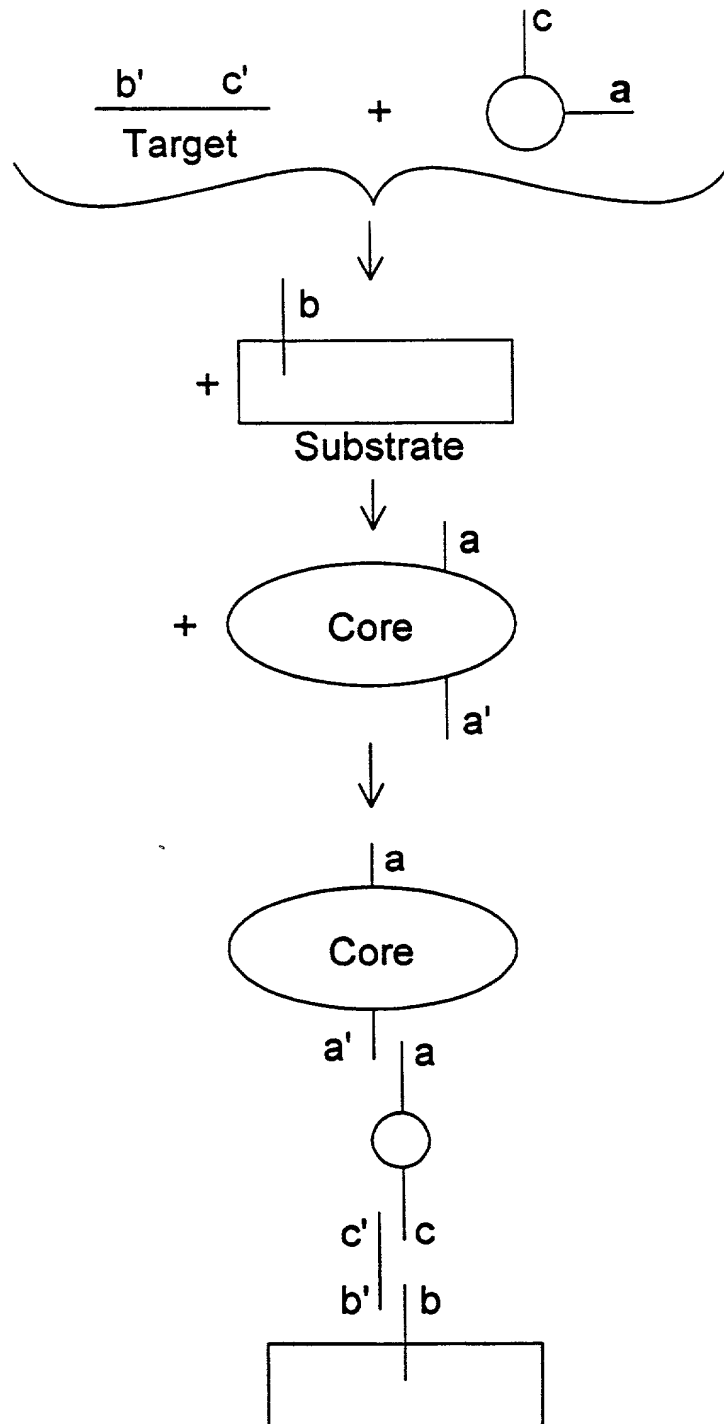


FIG. 28E



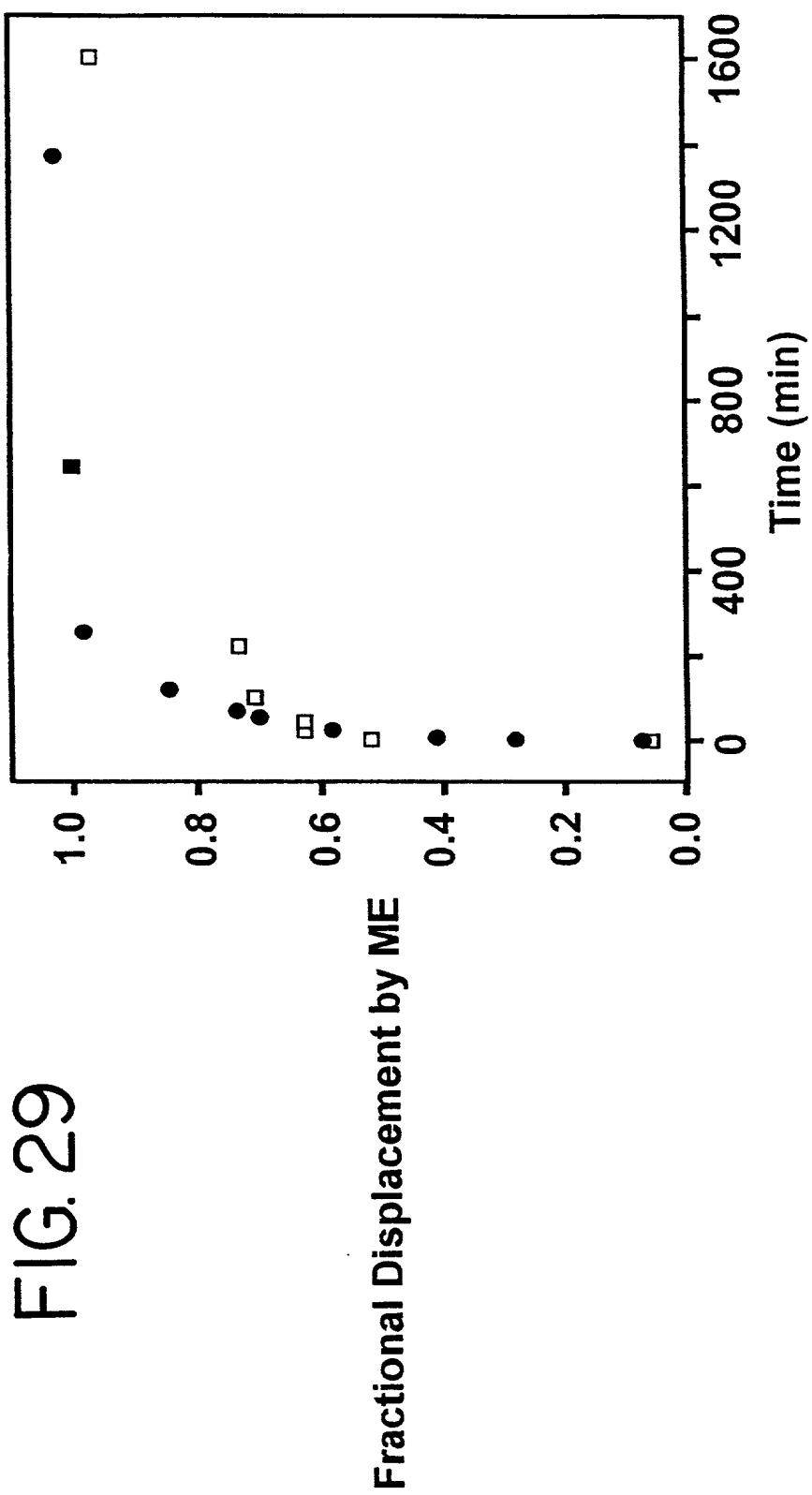


FIG. 30

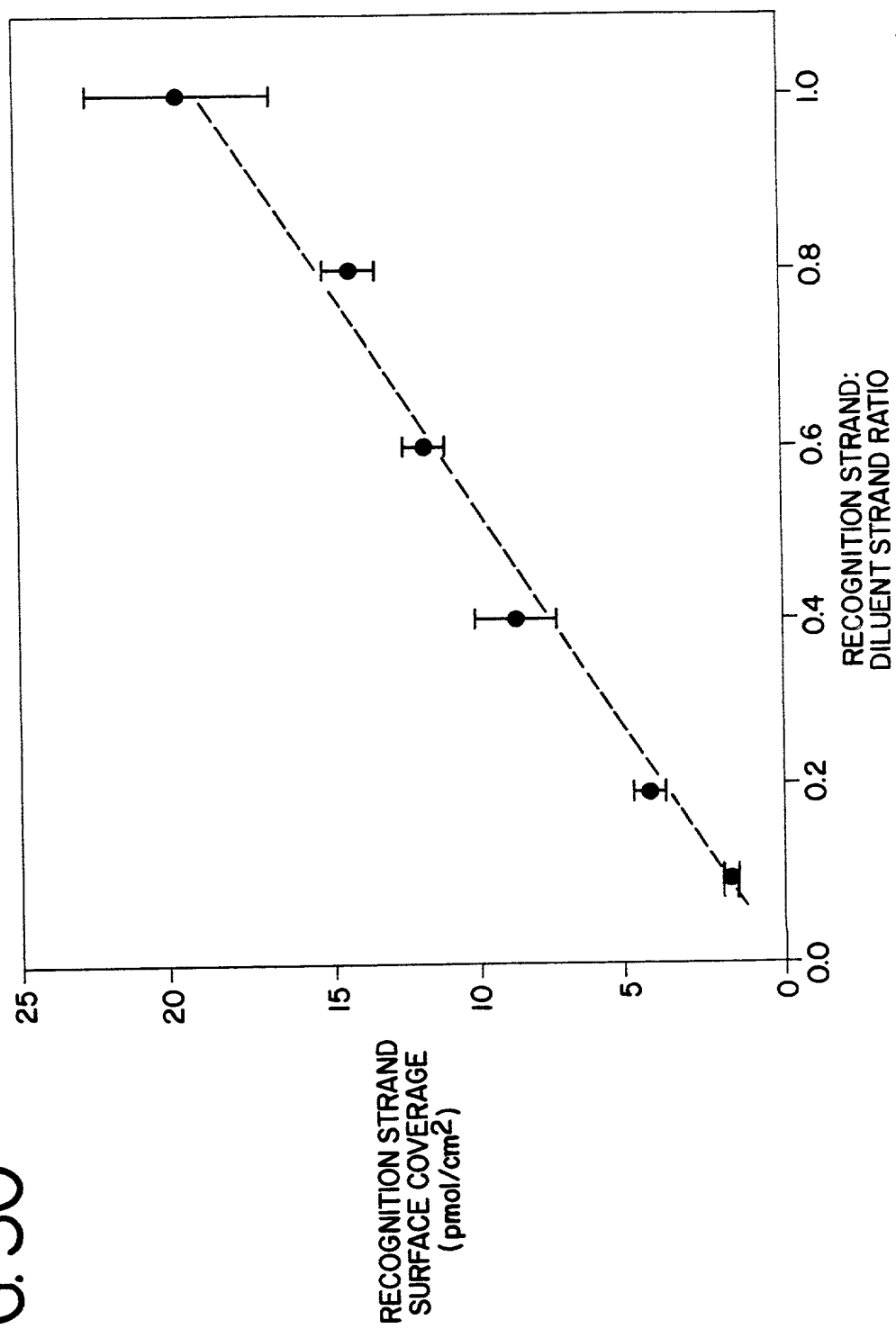


FIG. 31

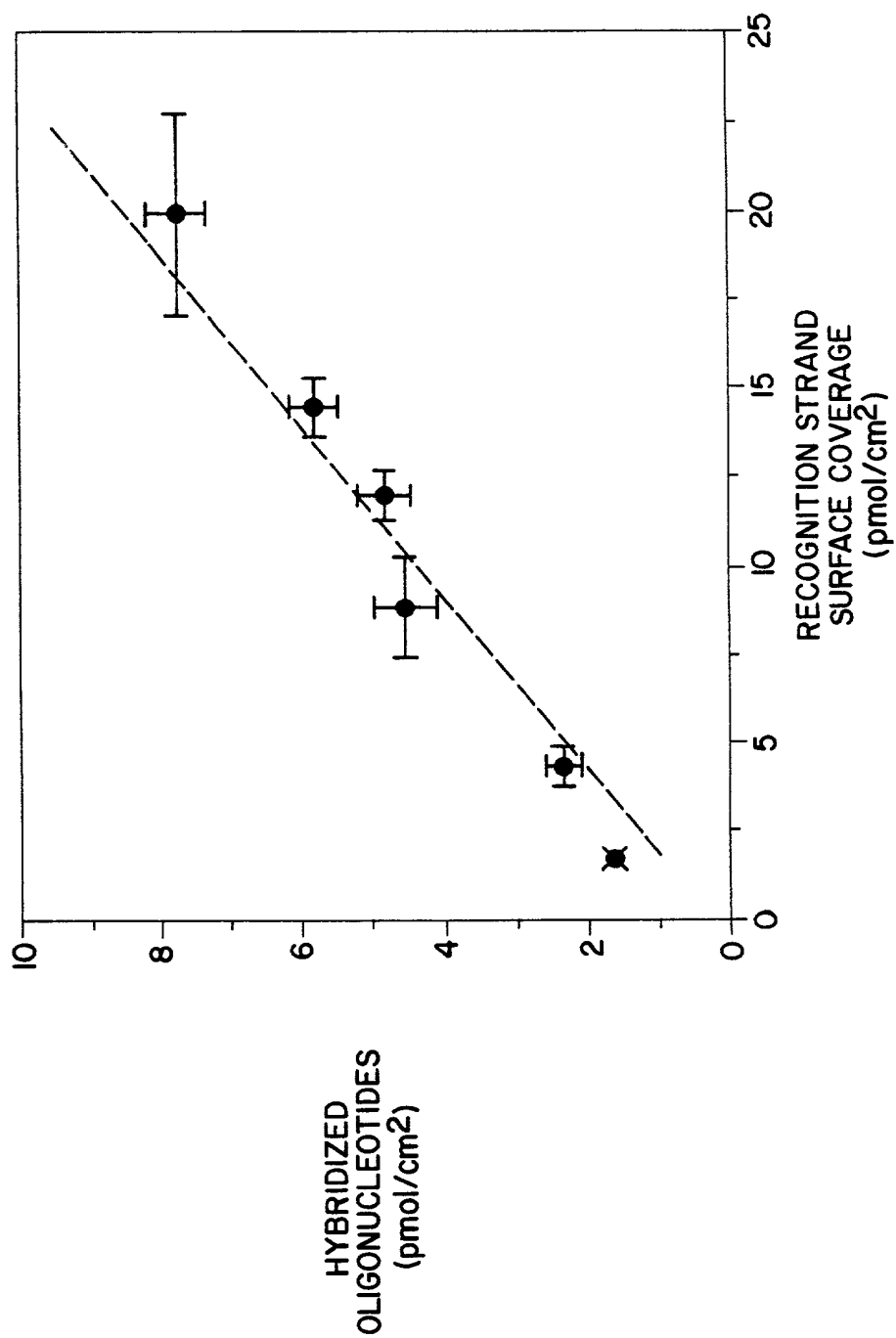


FIG. 33

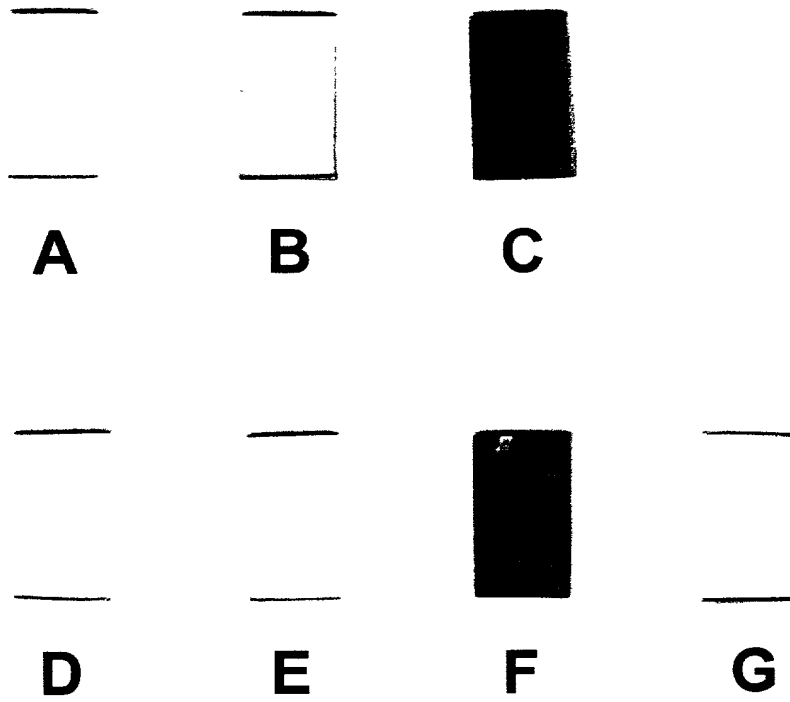
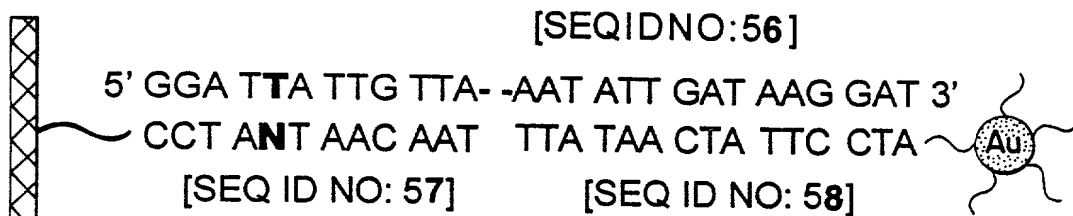


FIG. 32



N = A (complementary),
G,C,T (mismatched)

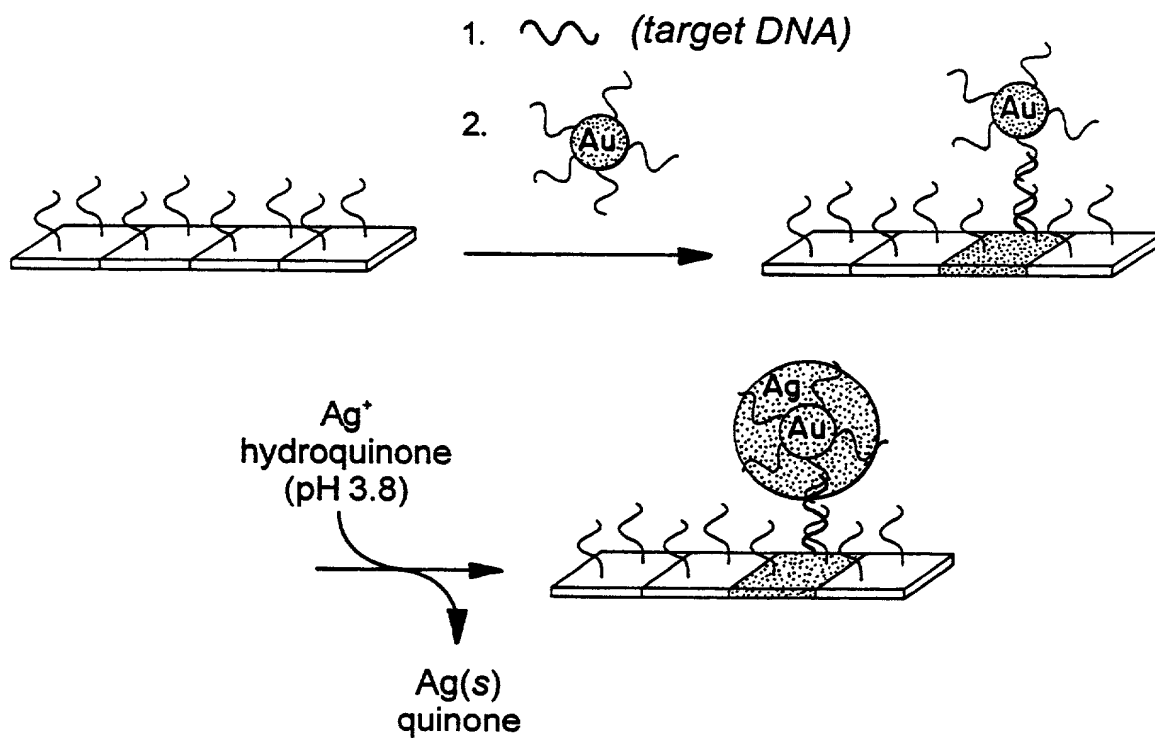


FIG. 34

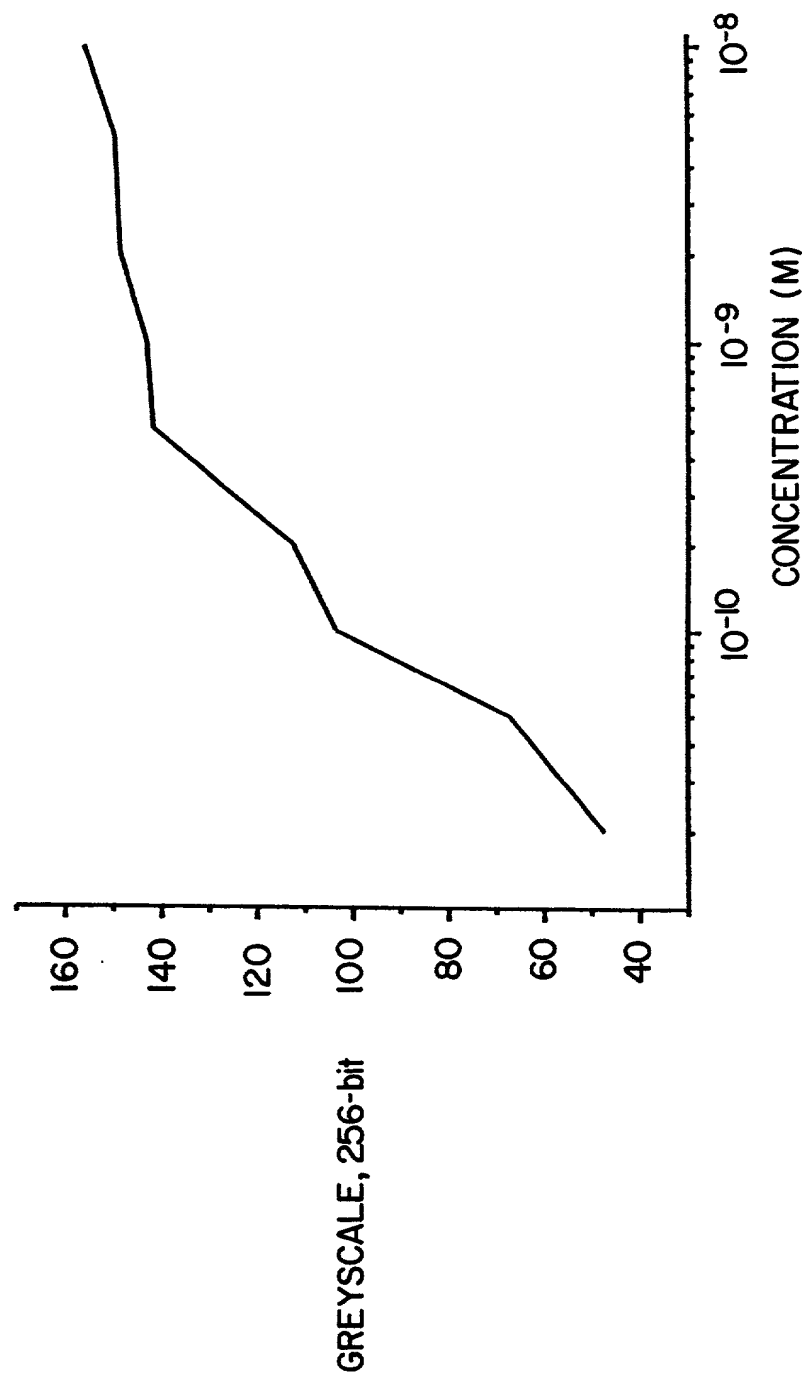


FIG.35A

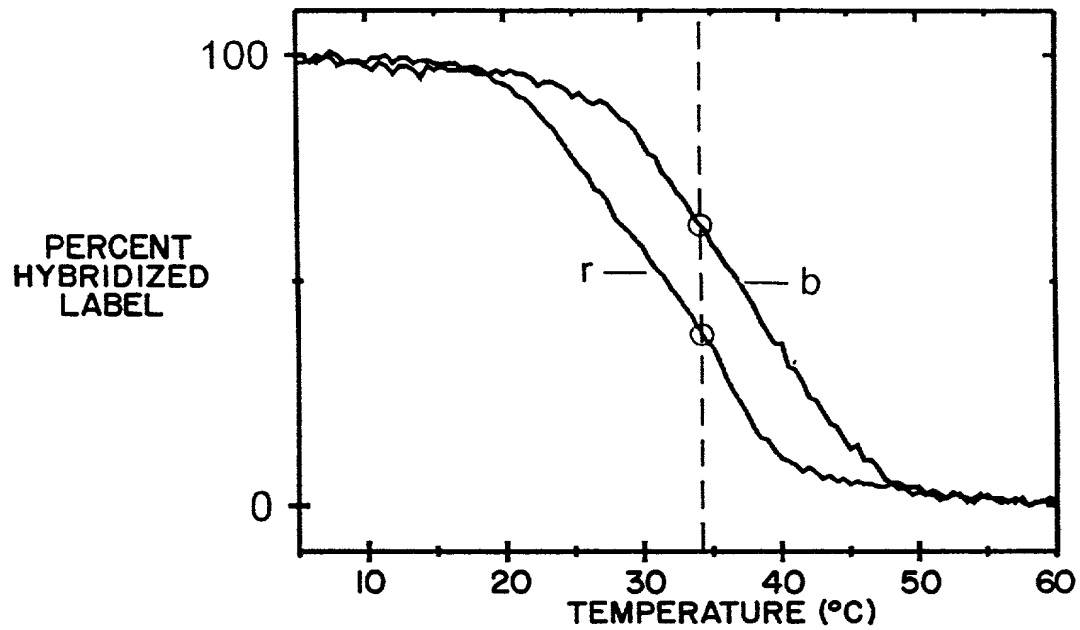


FIG.35B

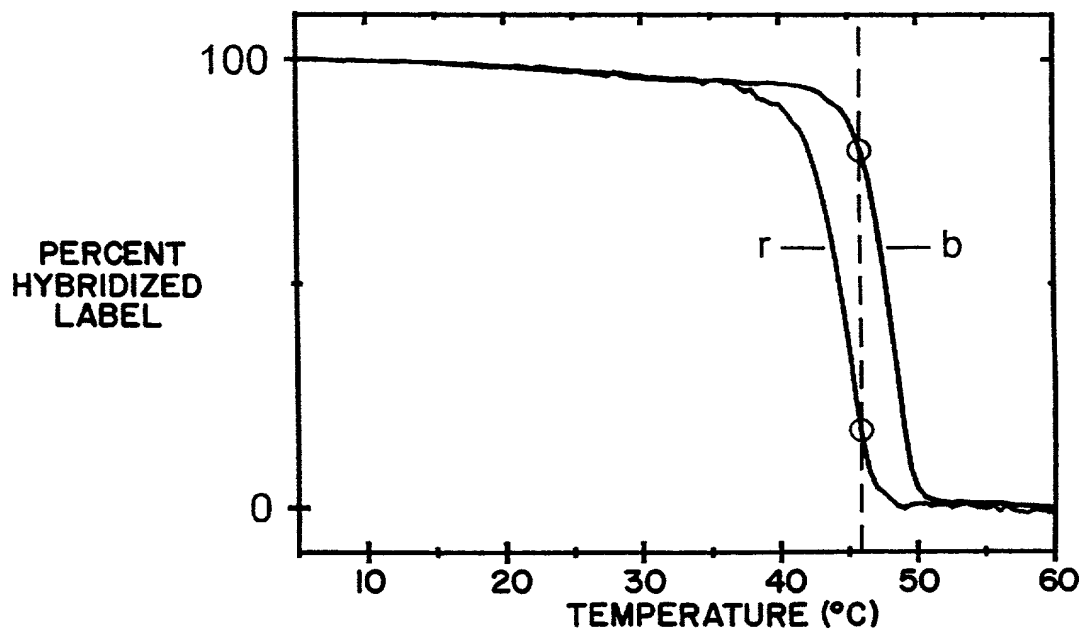


FIG. 36A

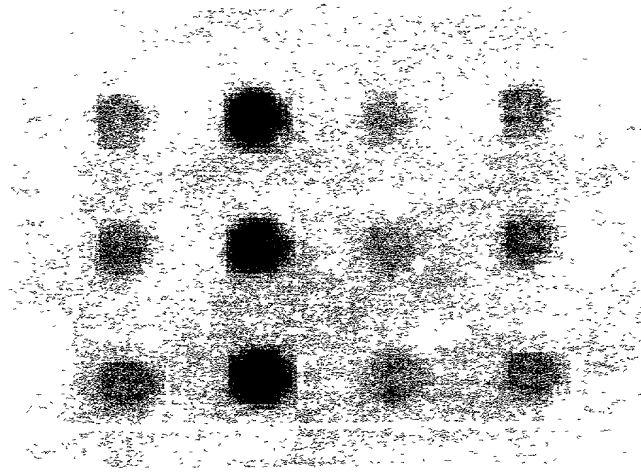
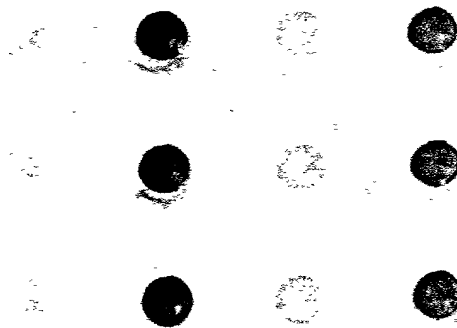


FIG. 36B



C A T G

FIG.37A

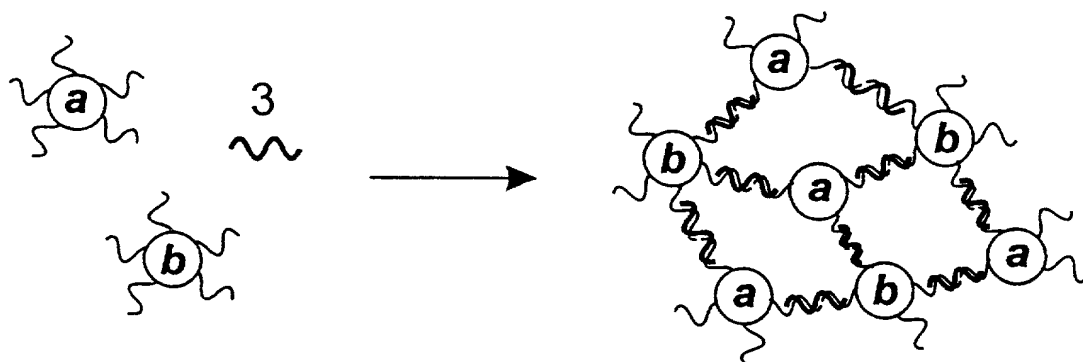


FIG.37B

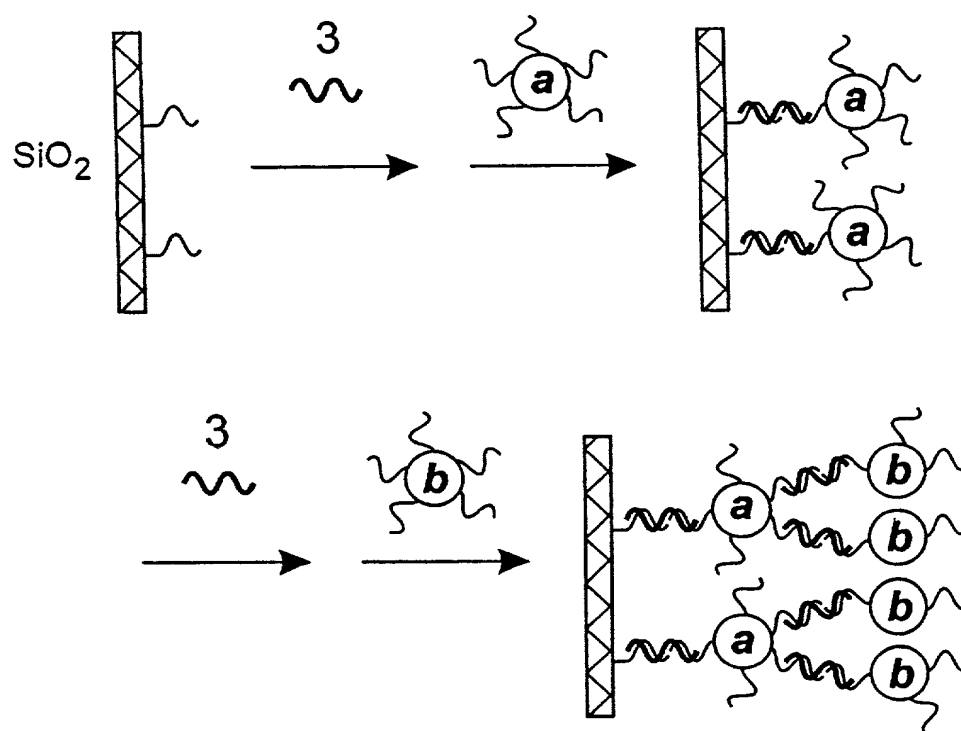


FIG.38A

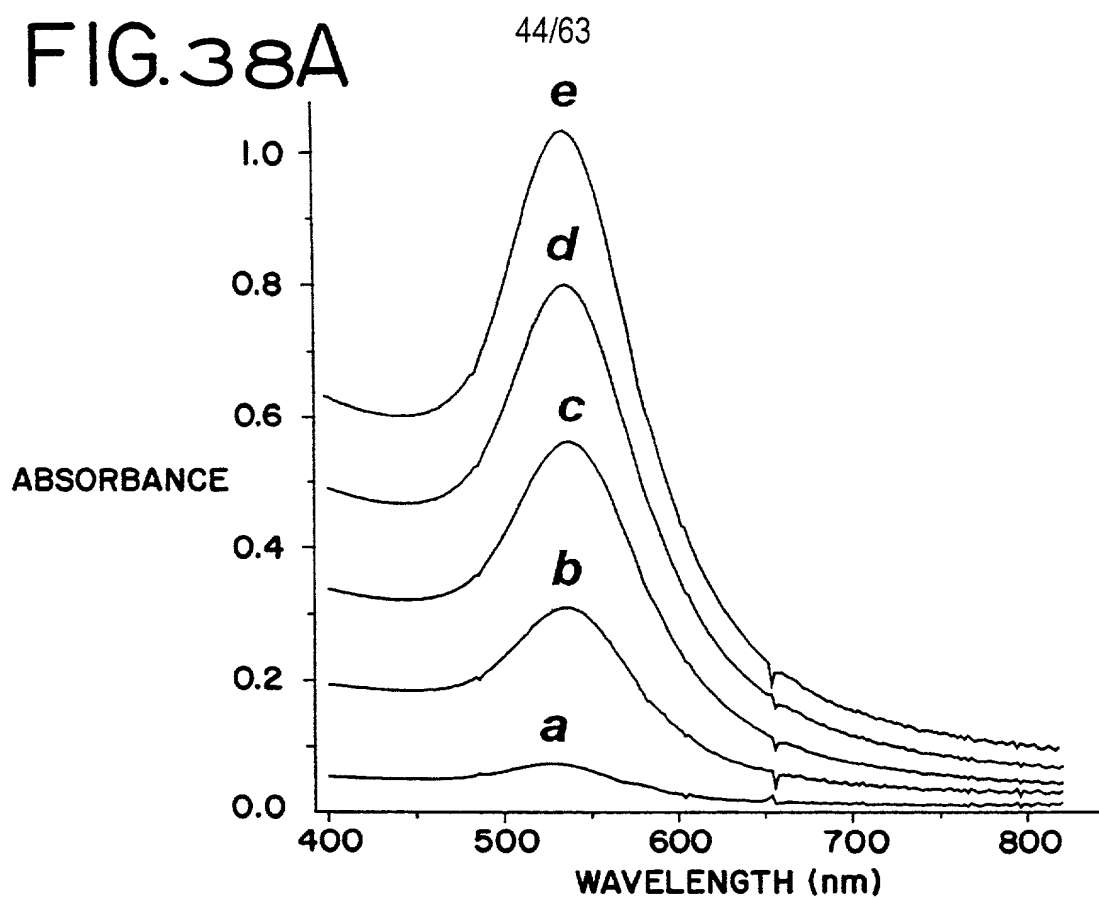


FIG.38B

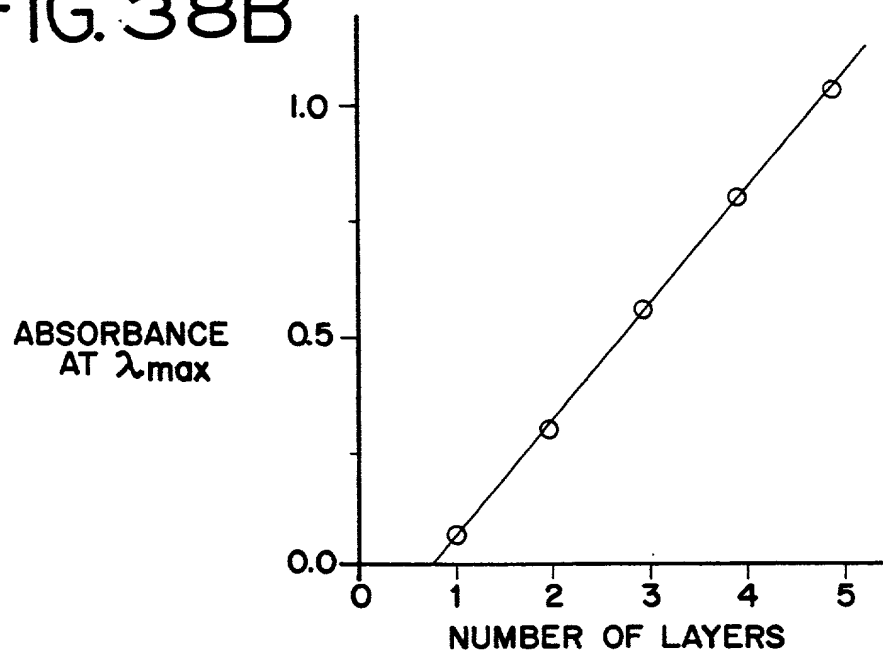


FIG. 39A

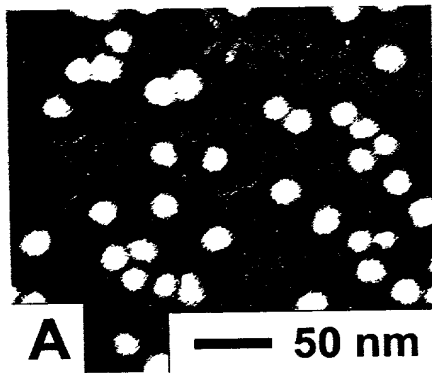


FIG. 39B

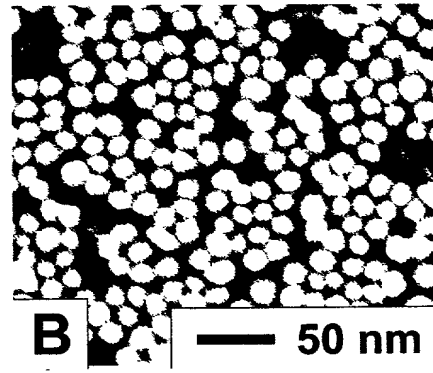


FIG.39C

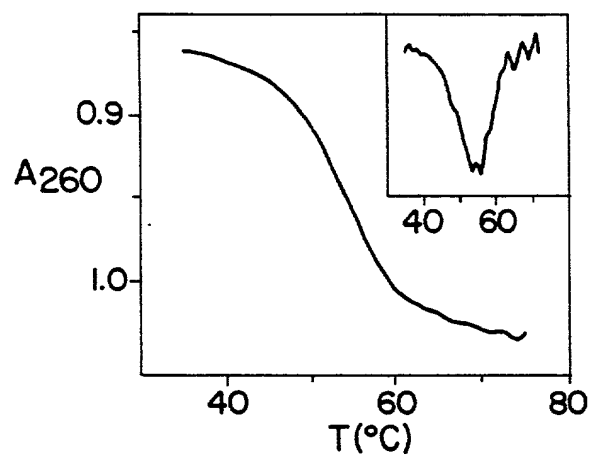


FIG.39D

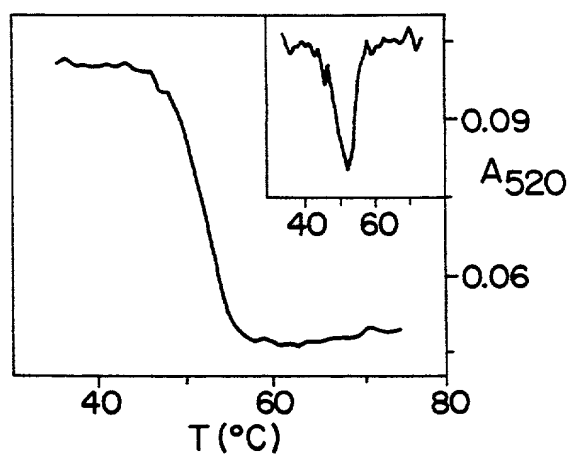


FIG.39E

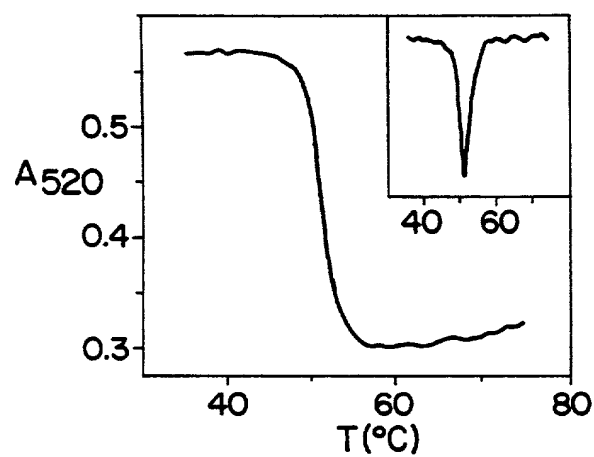


FIG.39F

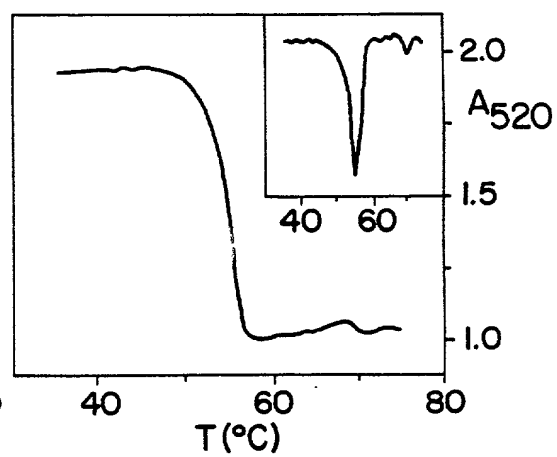


FIG. 40

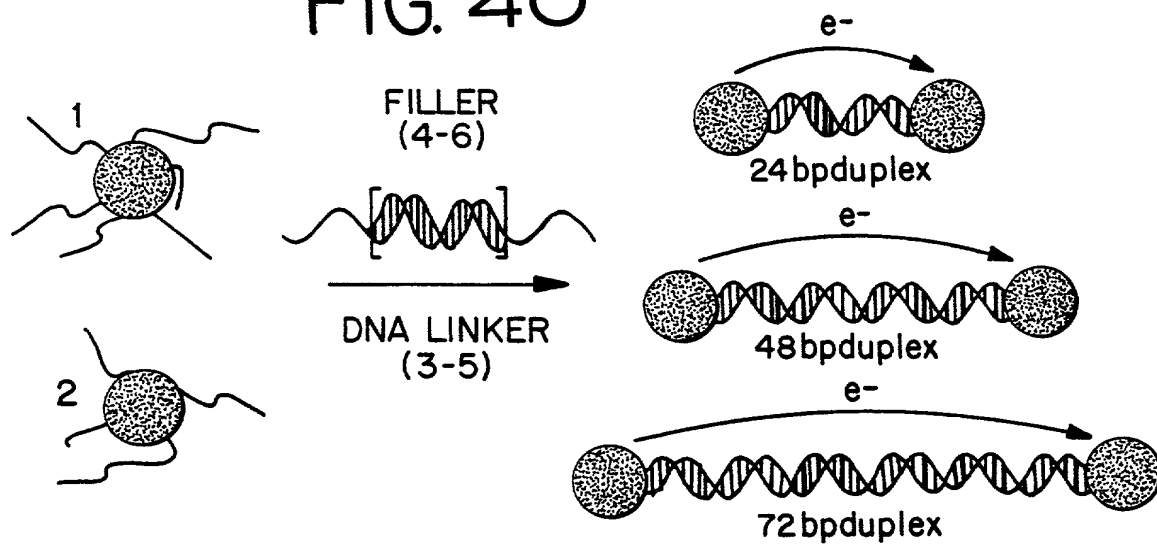


FIG. 41

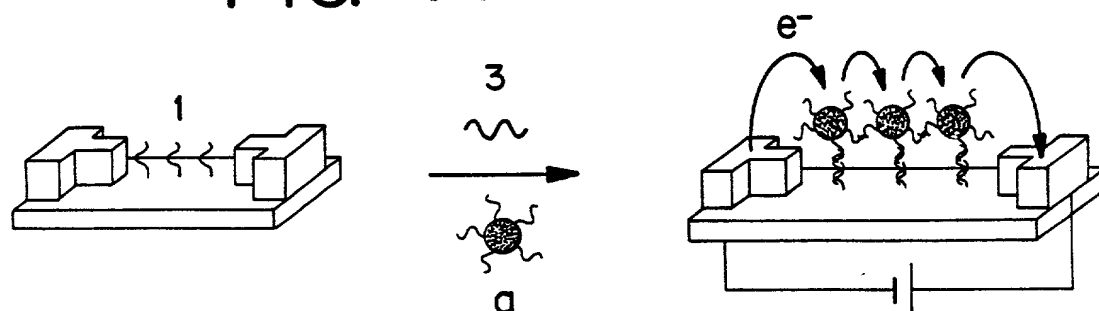
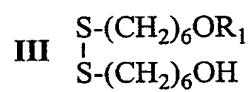
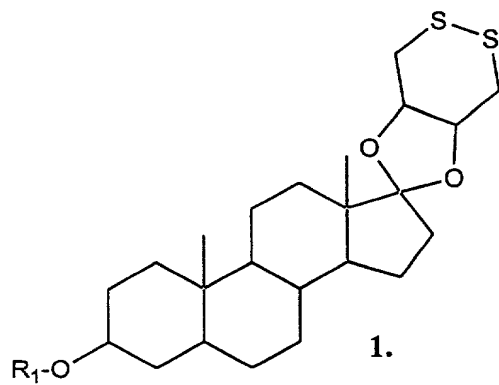


FIG. 42



R₁

a = H

b = (iPr)₂NP(OCH₂CH₂CN)-

c1 = 5'-p(A₂₀)-TATCGTTCCATCAGCT [SEQ ID NO: 65]

c2 = 5'-p(A₂₀)-TTGATCTTCCGTTCT [SEQ ID NO: 66]

Target I = 79-mer oligonucleotide with target region:

3'-.....ATAGCAAGGTAGTCGAGCAACTAGAAAGGCAAGA.....5'
[SEQ ID NO: 67]

FIG. 43

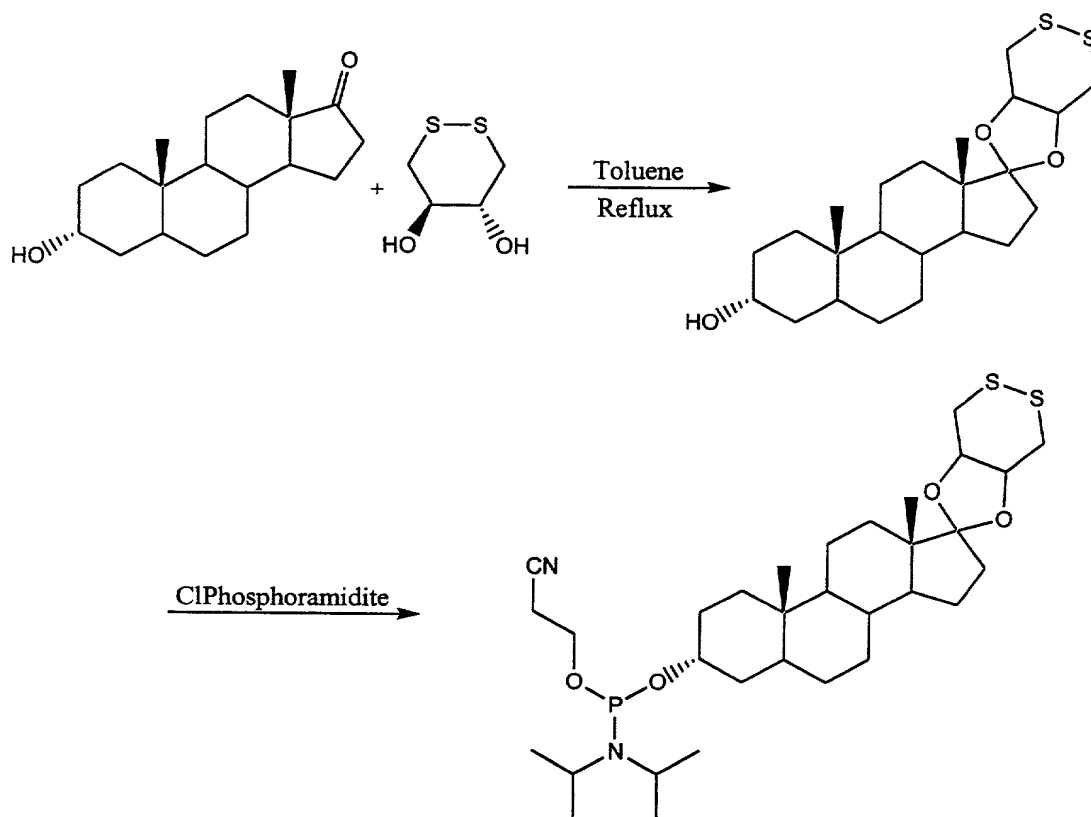
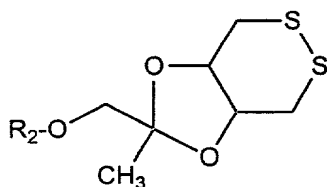


FIG. 44



2.

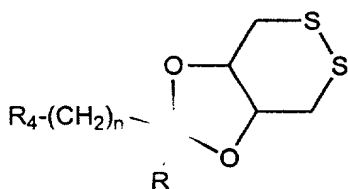
R₂

a = H

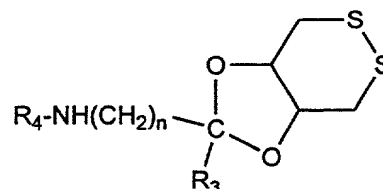
b = (iPr)₂NP(OCH₂CH₂CN)-c1 = 5'-p(A₂₀)-GCAGACCTCA [SEQ ID NO: 68]c2 = 5'-p(A₂₀)-CCTATGTGTCG [SEQ ID NO: 69]D = 5'-p(A₂₀) [SEQ ID NO: 70]

Target I = 63-mer oligonucleotide with target region:

3'-.....CGTCTGGAGTGGATAACACAGC.....5'
[SEQ ID NO: 71]



3.



4.

R₃ = hydrogen, an alkyl group, an aryl group, or a substituted alkyl or aryl groupR₄ = an attached oligonucleotide or modified oligonucleotide

FIG. 45

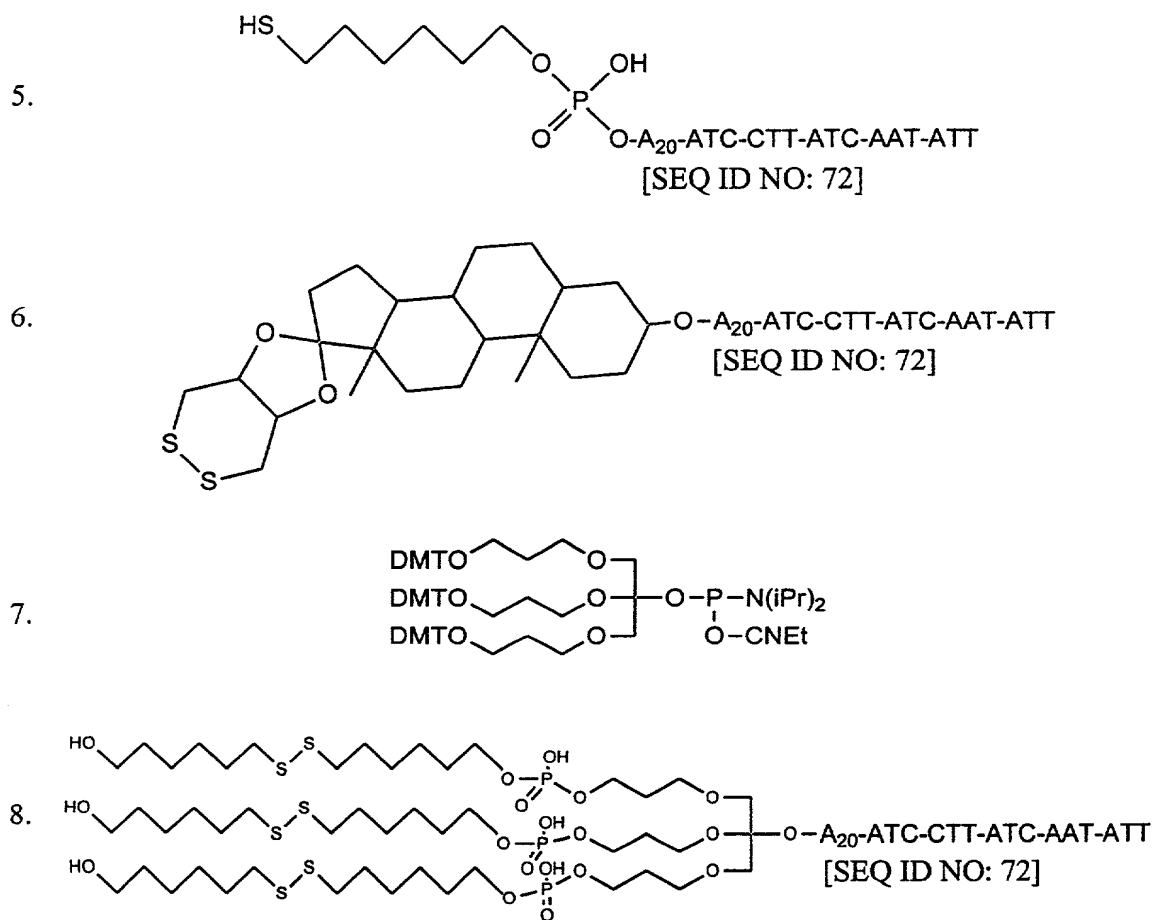
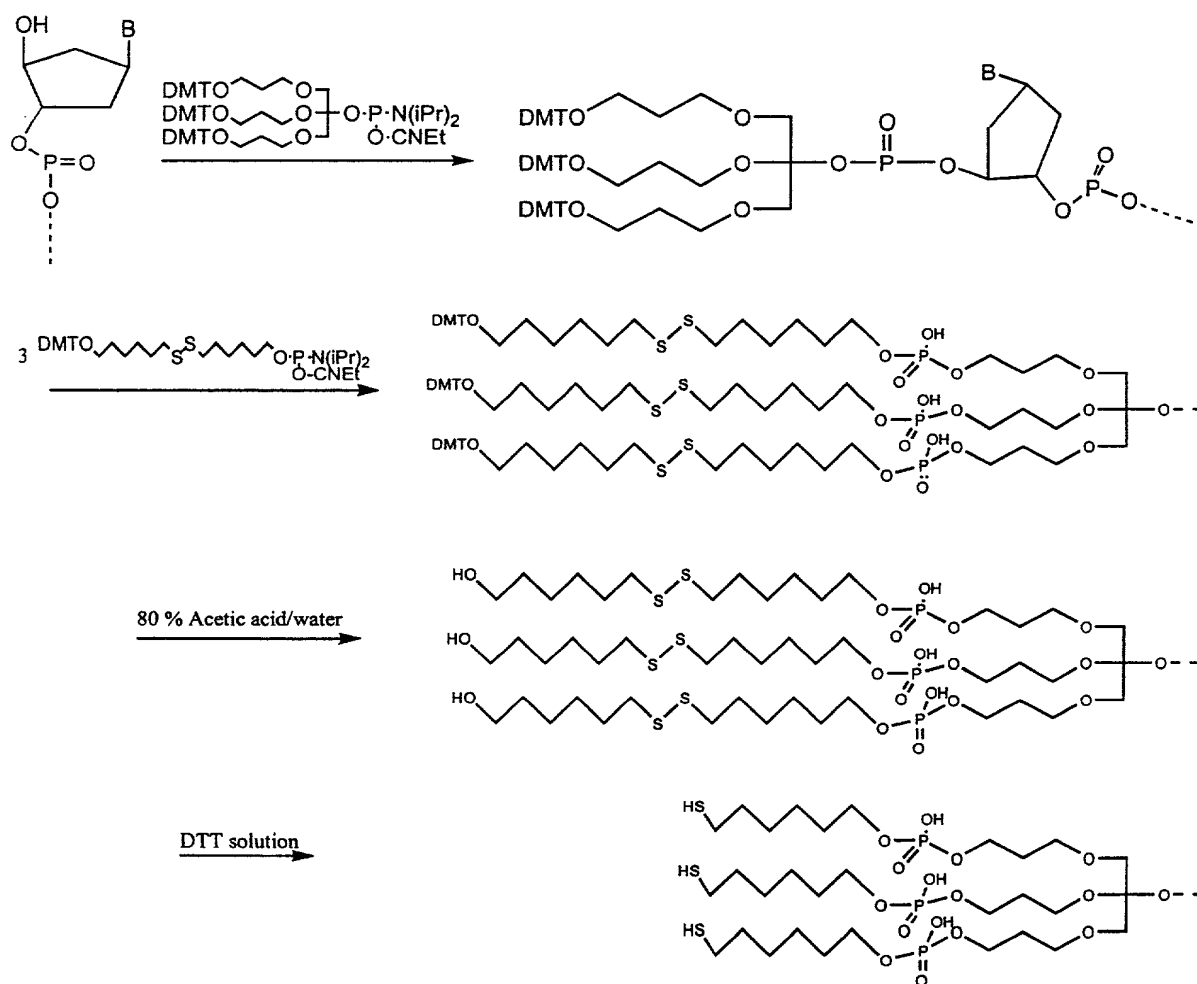


FIG. 46



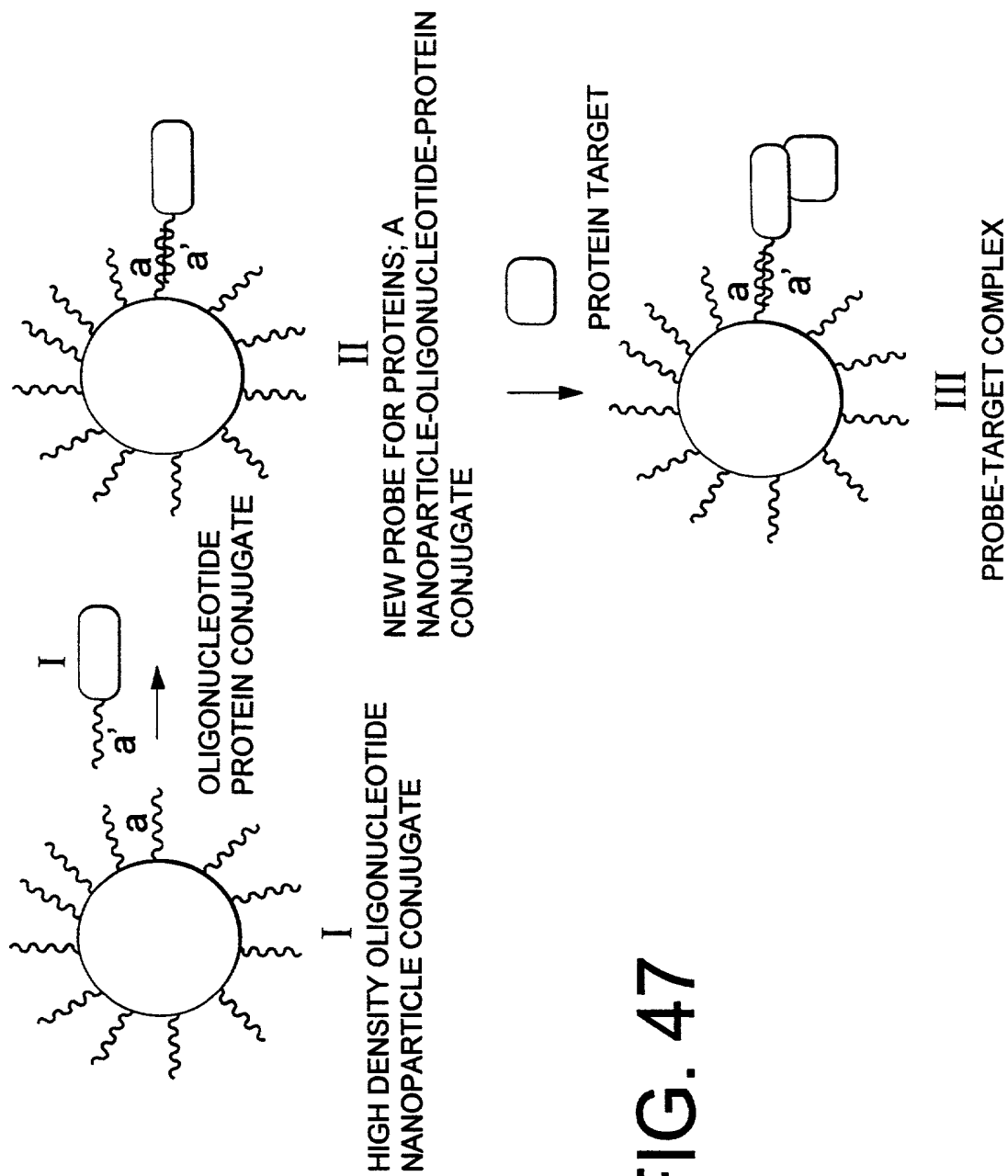
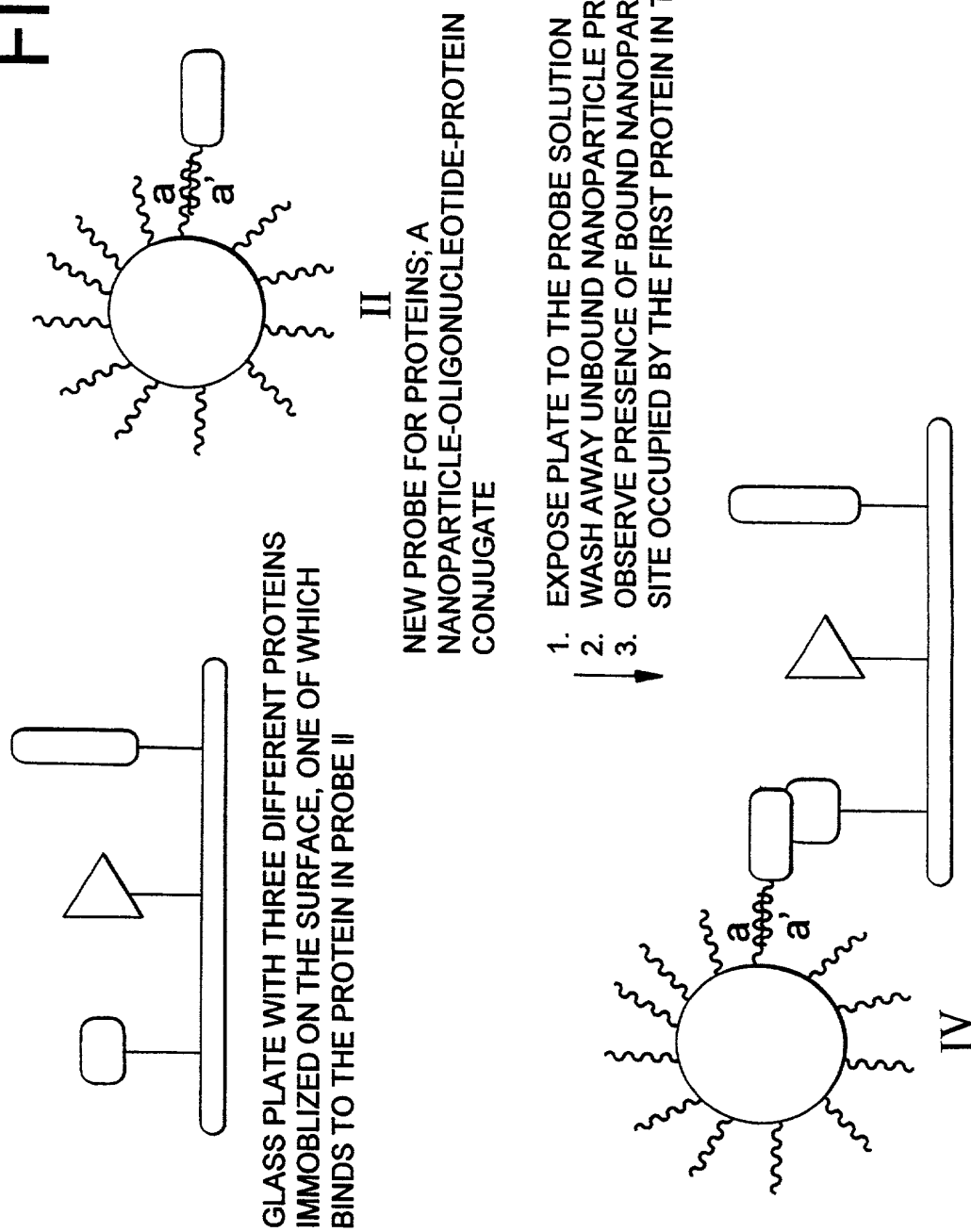


FIG. 47

FIG. 48



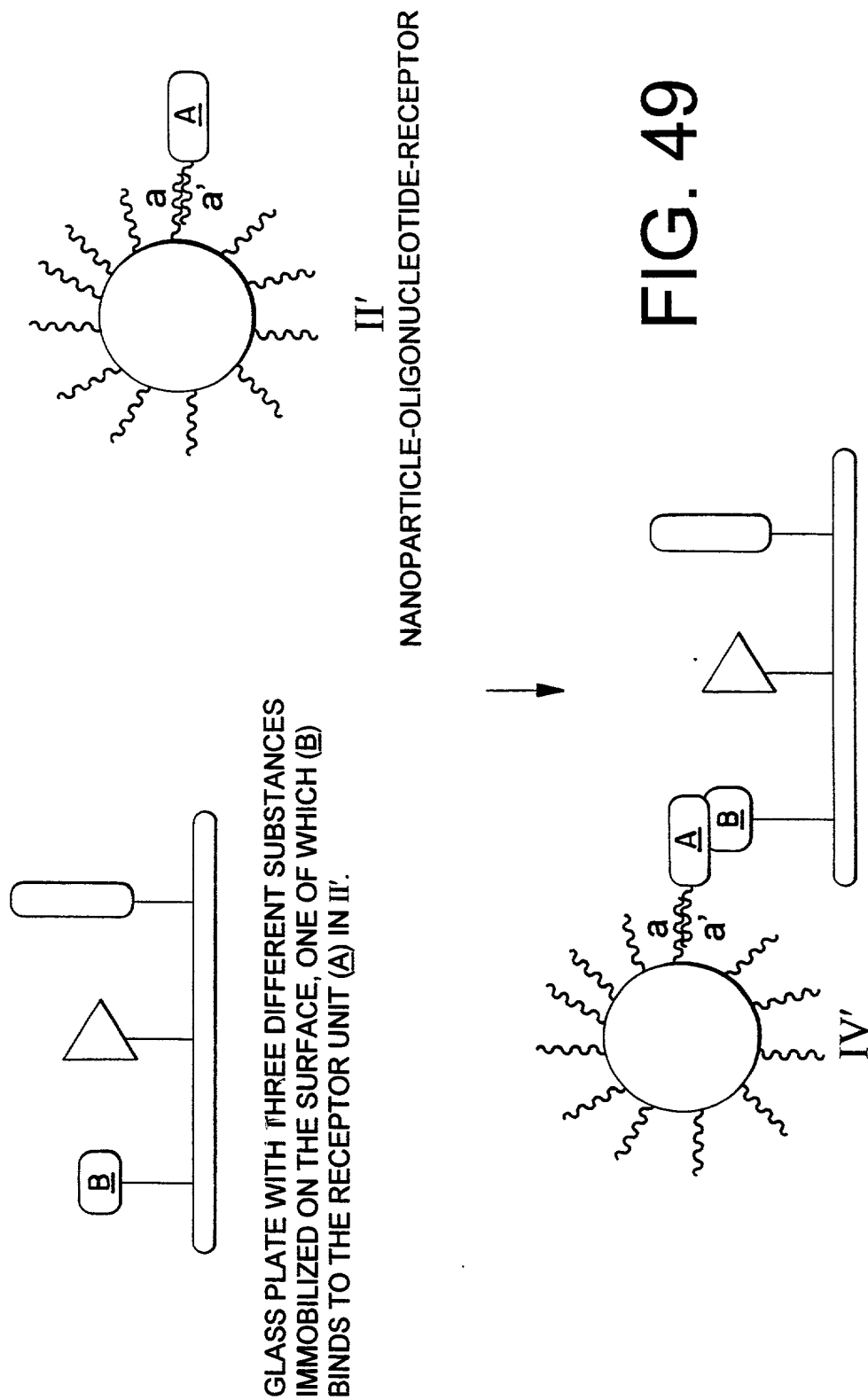


FIG. 50A

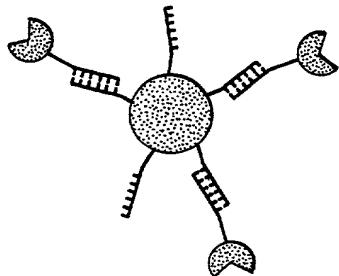


FIG. 50B

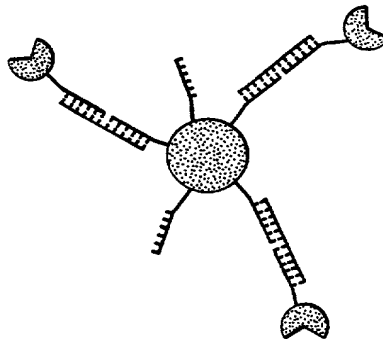


FIG. 51A

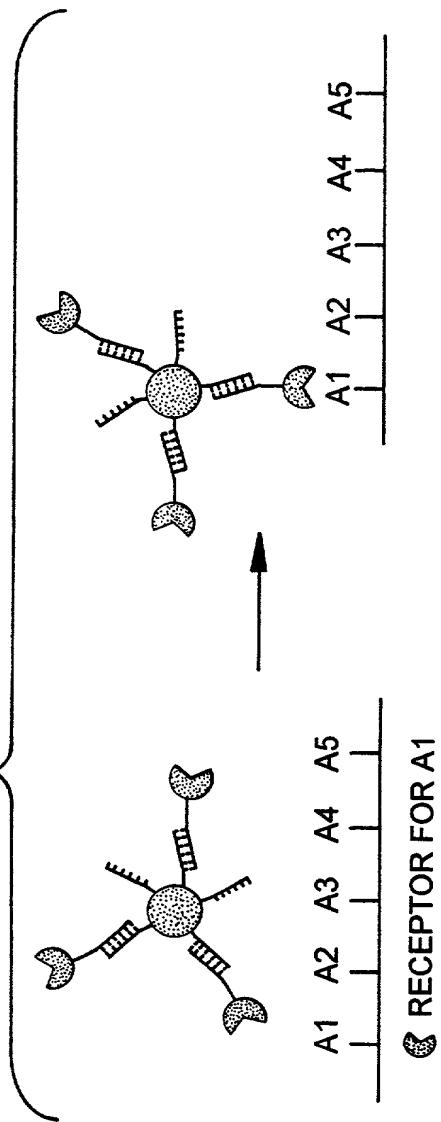


FIG. 51B

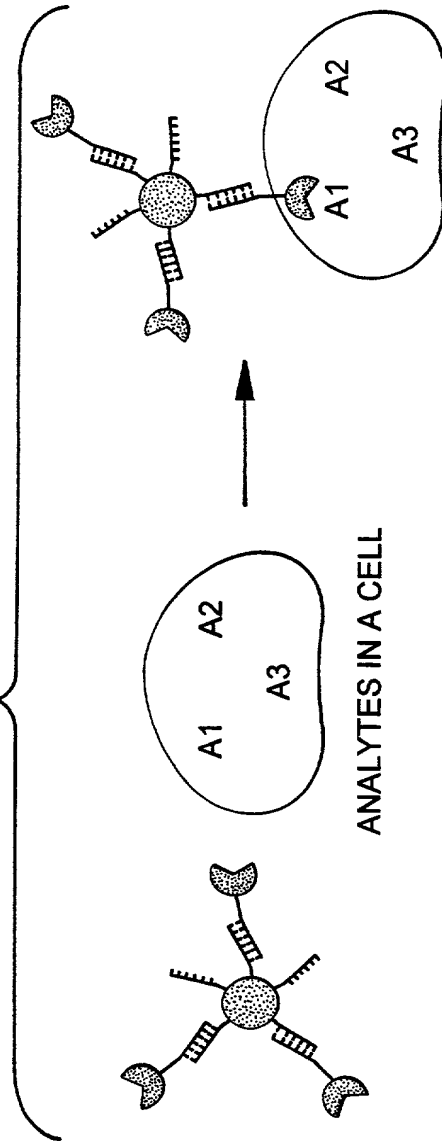
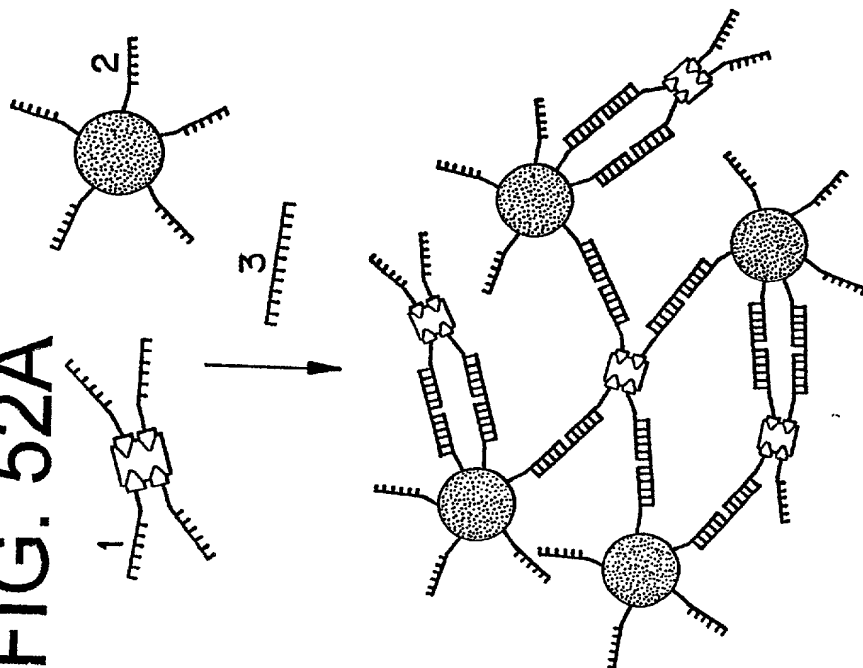


FIG. 52A



1 3' biotin-TEG-A₁₀-ATG CTC AAC TCT 5' [SEQ. ID NO. 73]

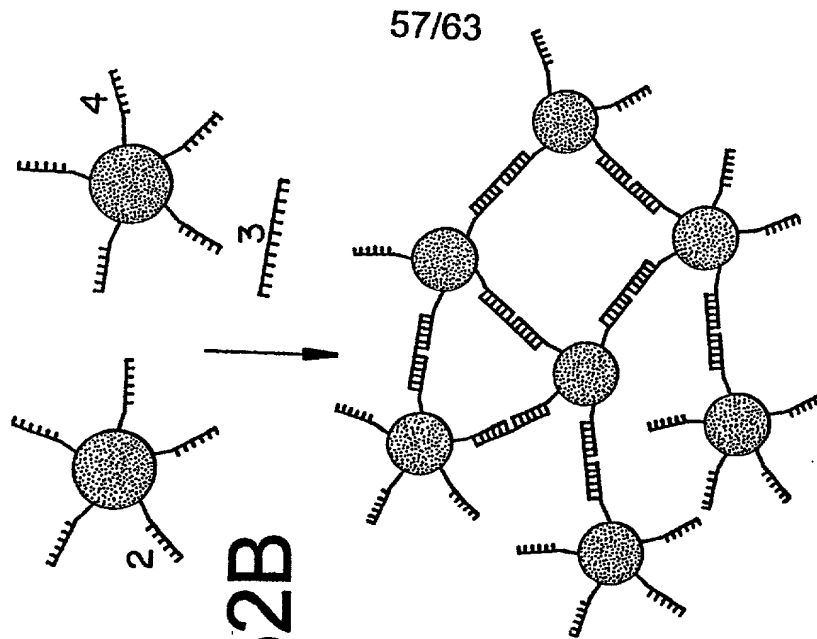
2 5' SH(CH₂)₆-A₁₀-CGC ATT CAG GAT 3' [SEQ. ID NO. 74]

3 5' TAC GAG TTG AGA ATC CTG AAT GCG 3' [SEQ. ID NO. 75]

● 13 nm Au NANOPARTICLES

⌘ STREPTAVIDIN

FIG. 52B



2 5' SH(CH₂)₆-A₁₀-CGC ATT CAG GAT 3'

3 5' TAC GAG TTG AGA ATC CTG AAT GCG 3'

4 3' SH(CH₂)₃-A₁₀-ATG CTC AAC TCT 5'

● 13 nm Au NANOPARTICLES

FIG. 52C

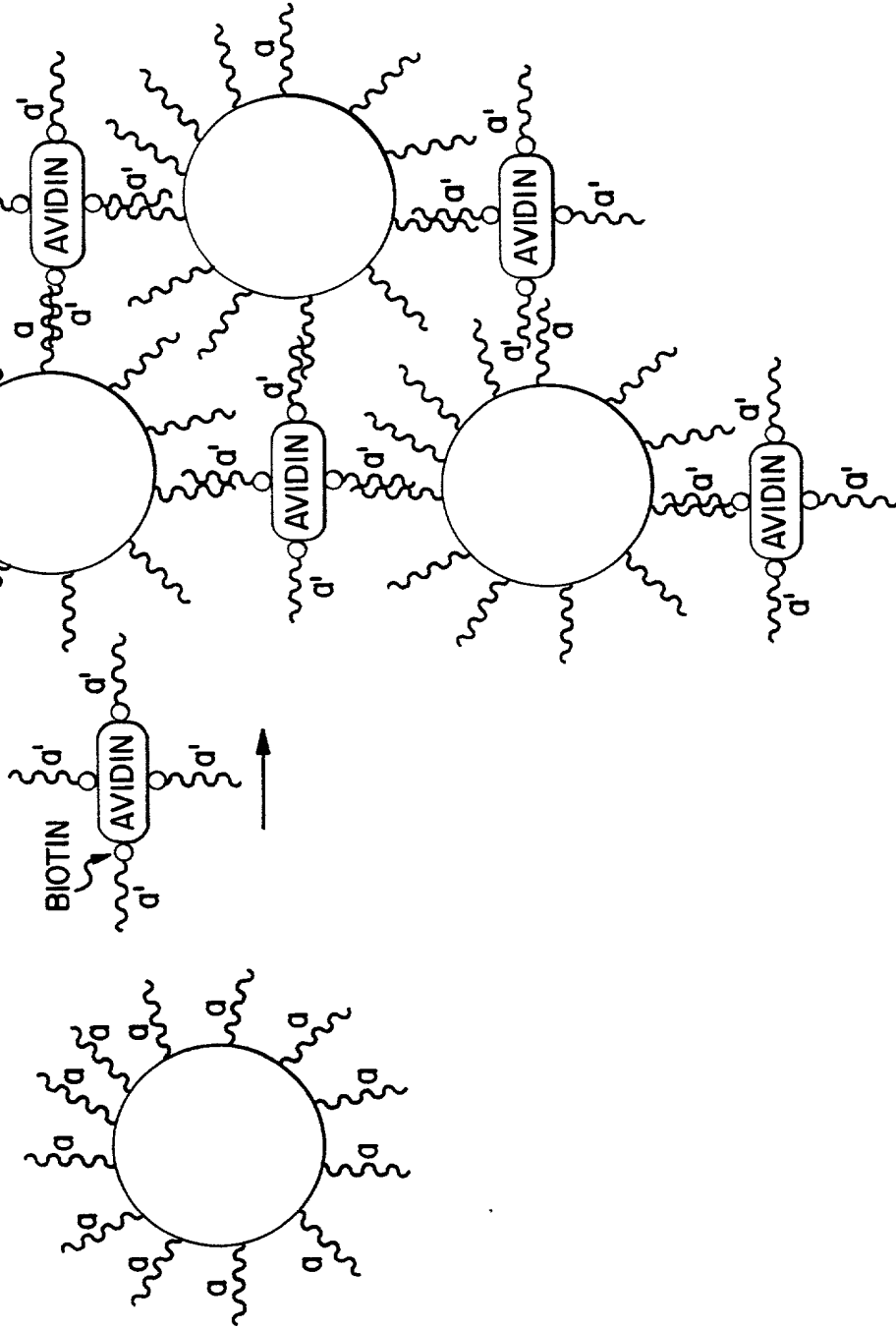


FIG. 53

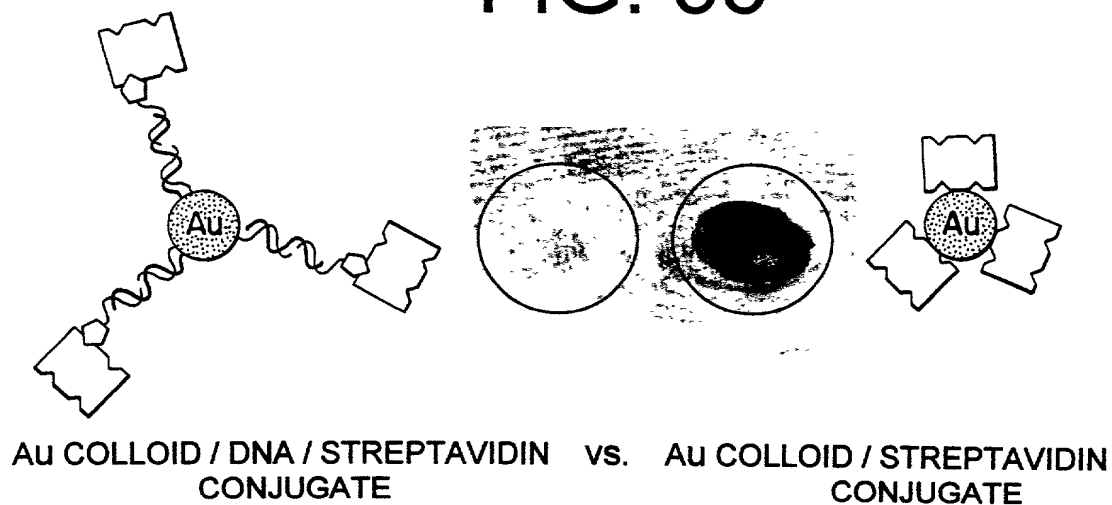


FIG. 54

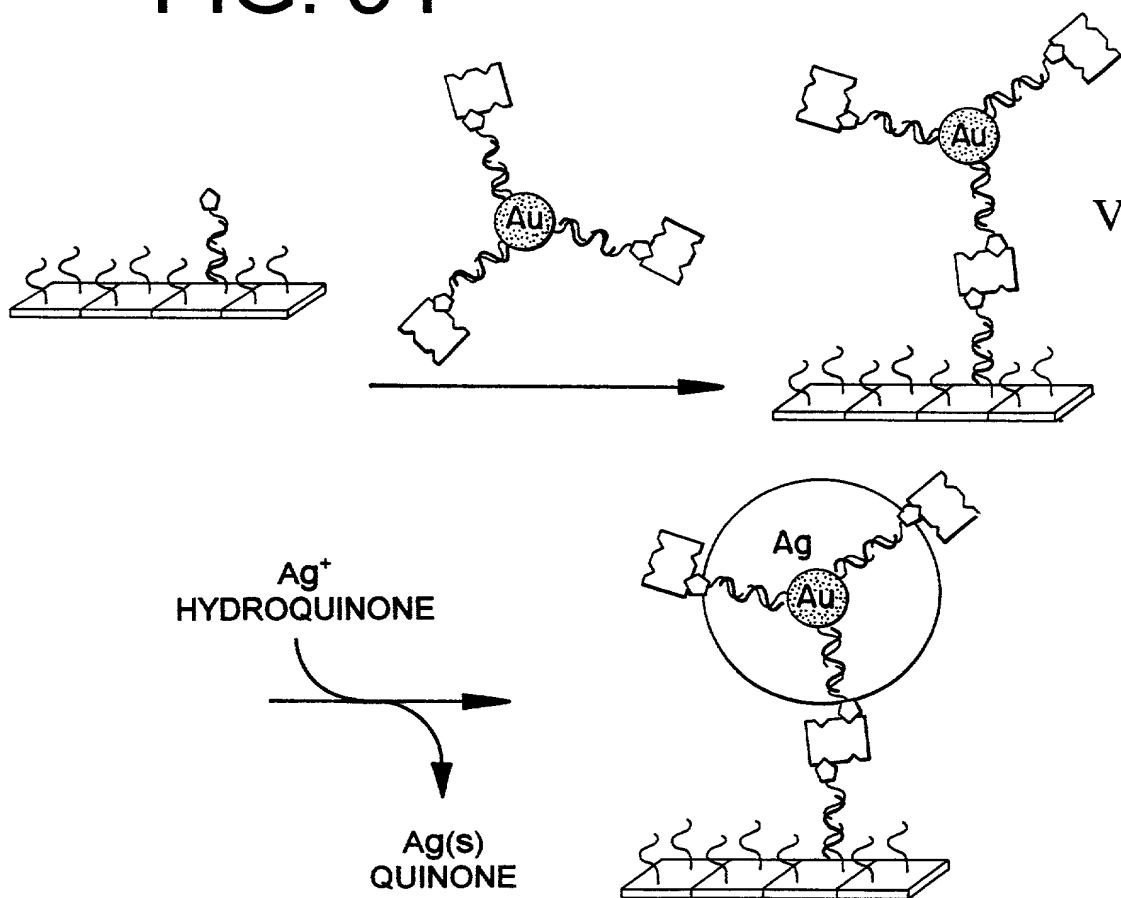


FIG. 55

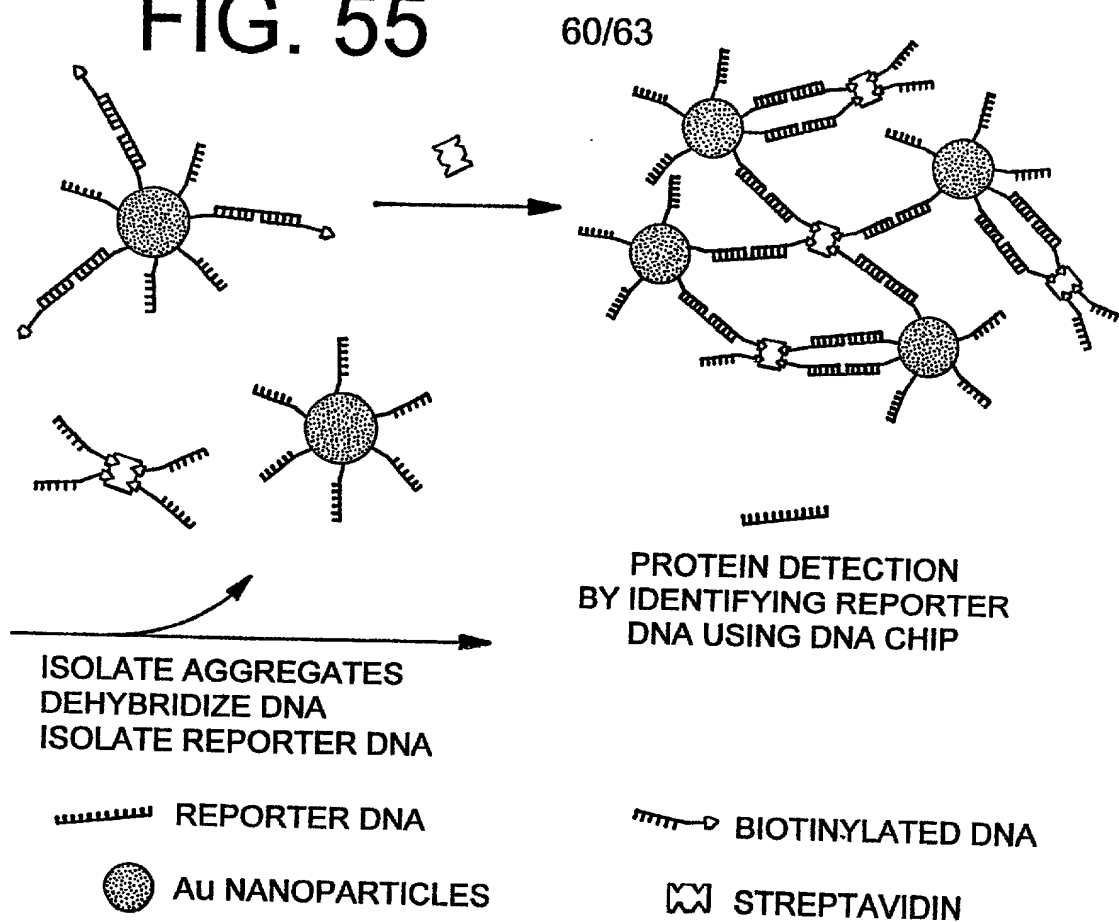


FIG. 56

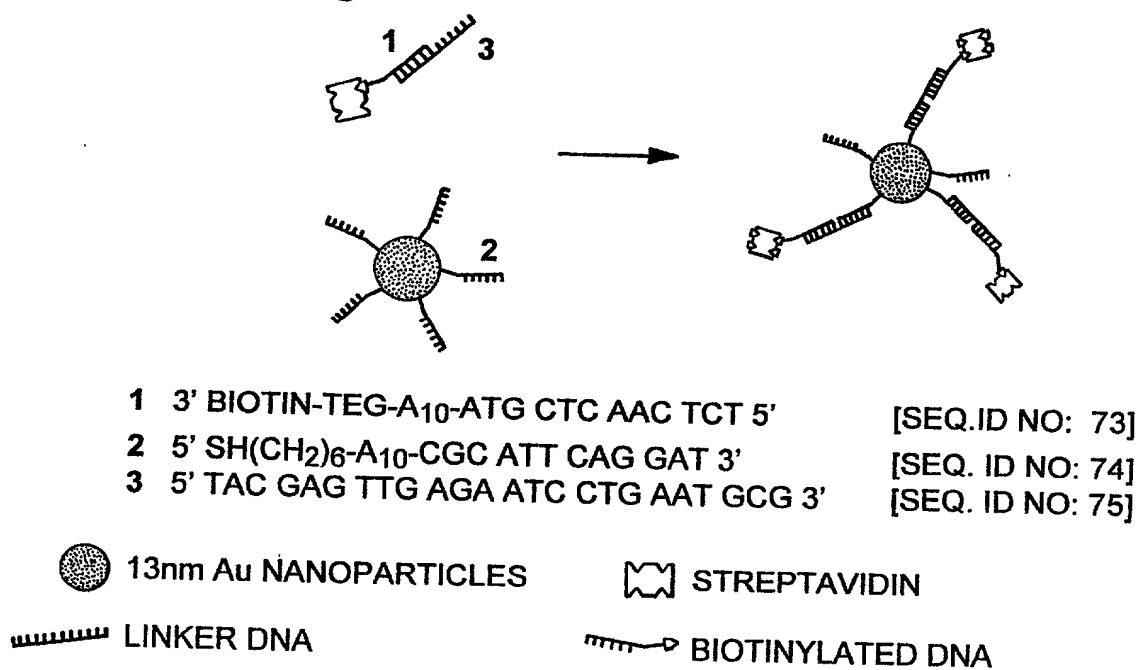


FIG. 57A

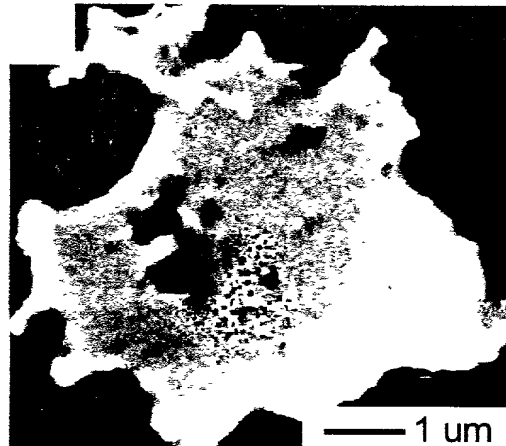


FIG. 57B

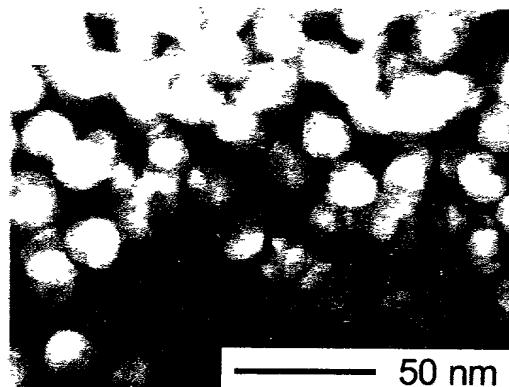


FIG. 58A

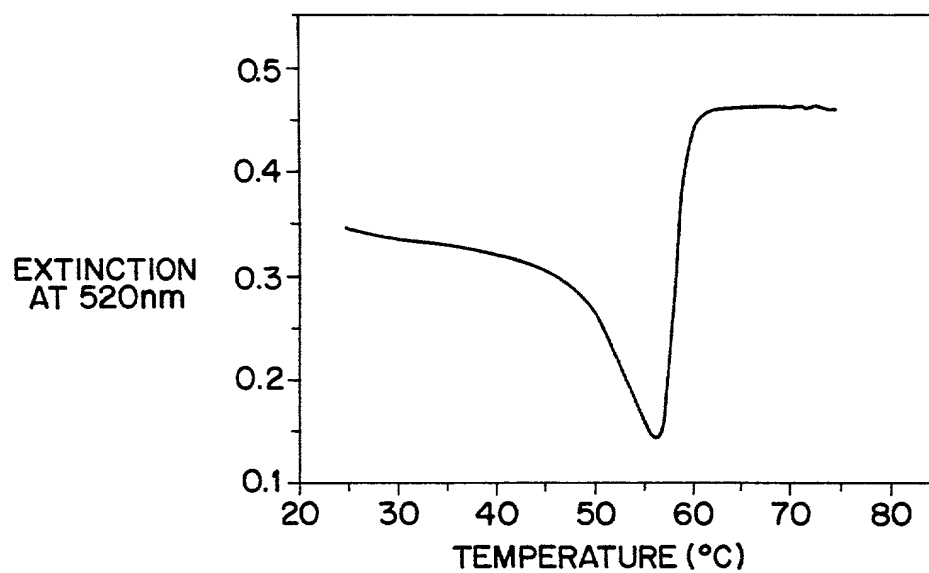


FIG. 58B

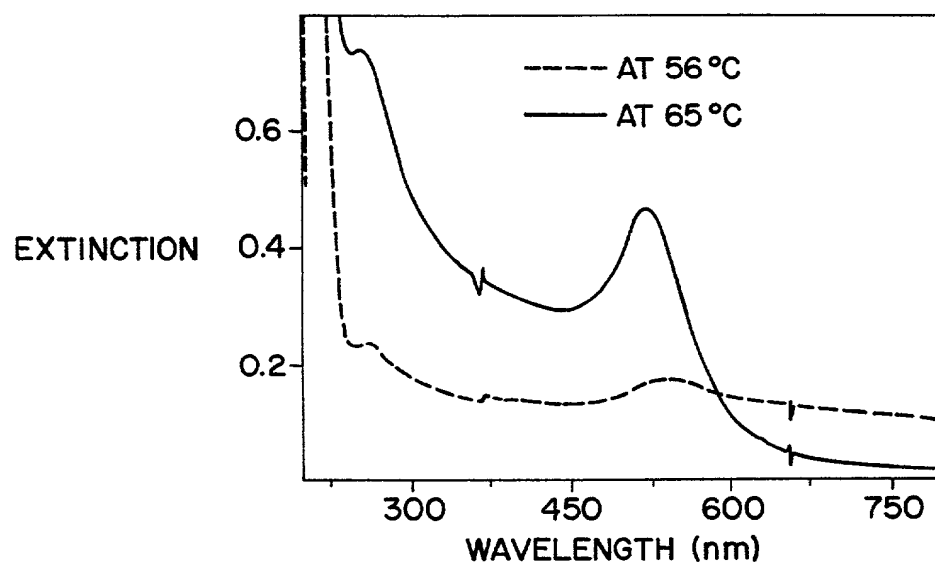


FIG. 59

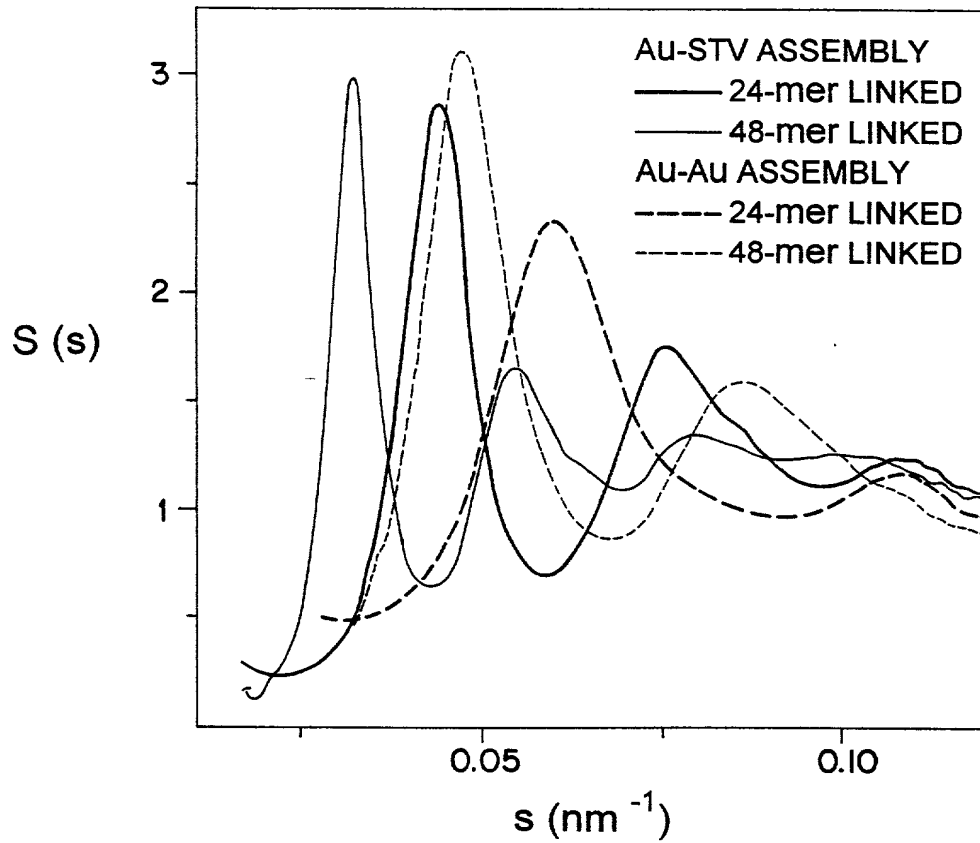


Figure 60

Scheme 1

